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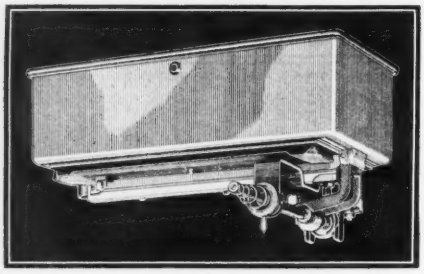

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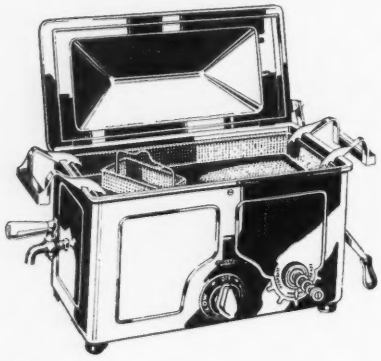

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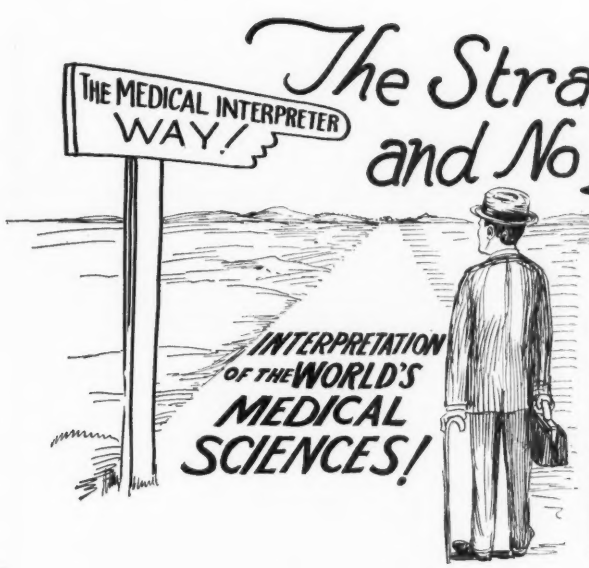

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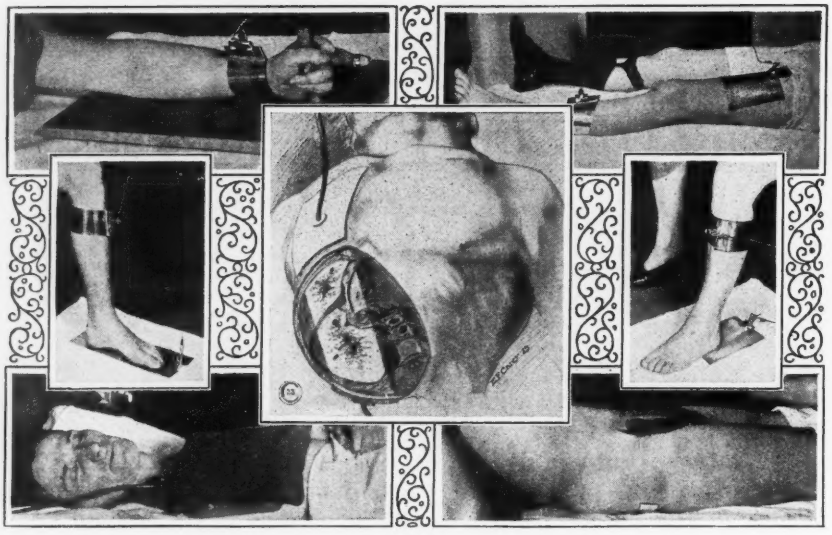

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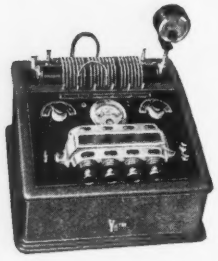

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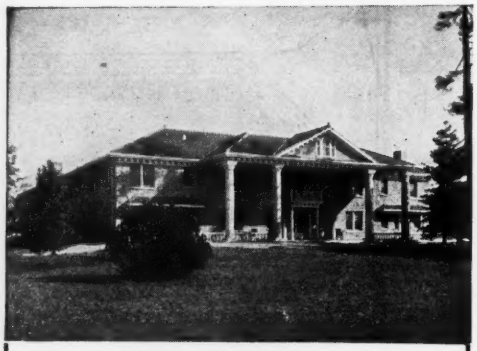

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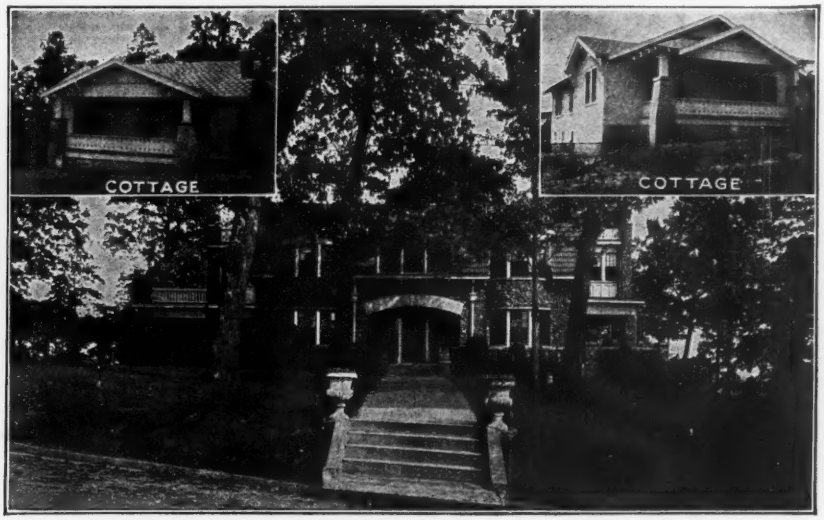

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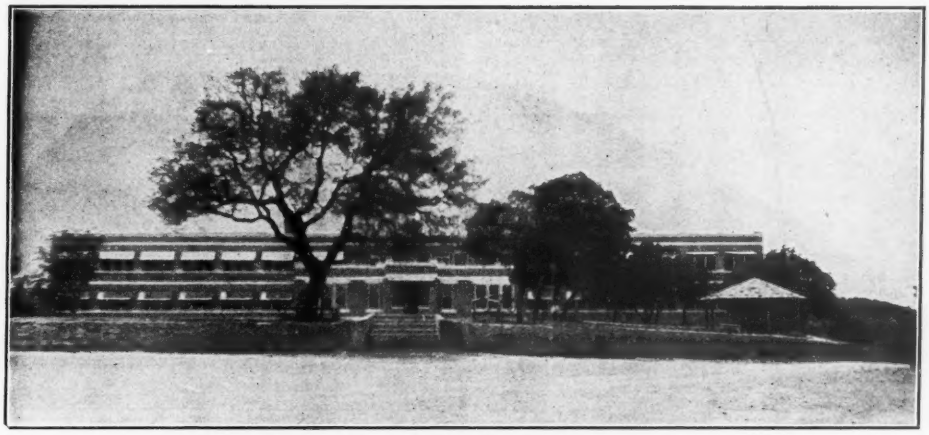

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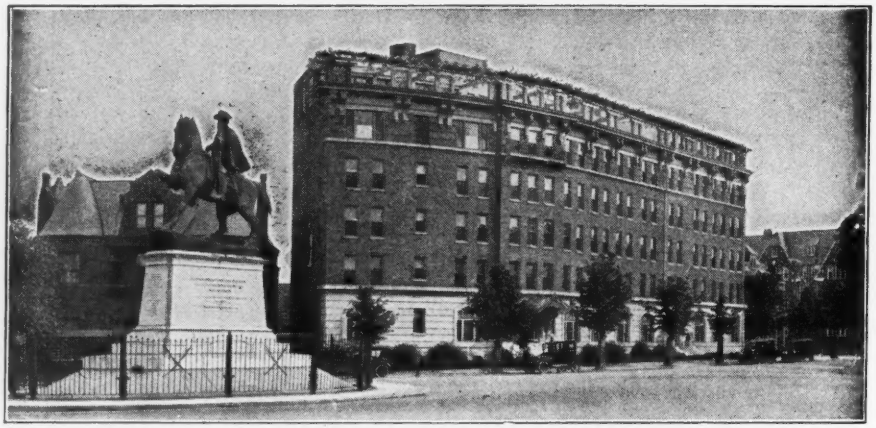

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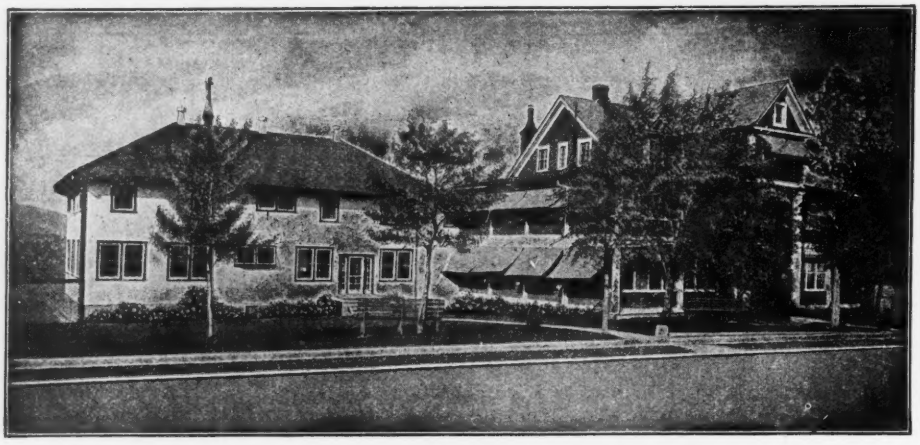

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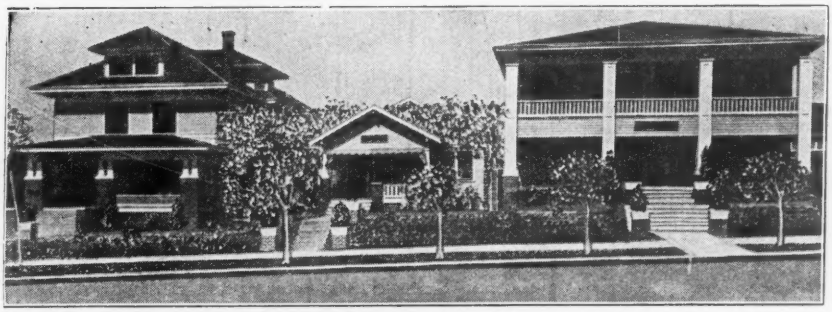

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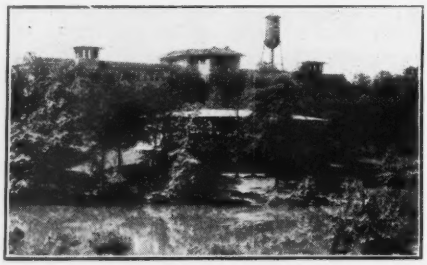

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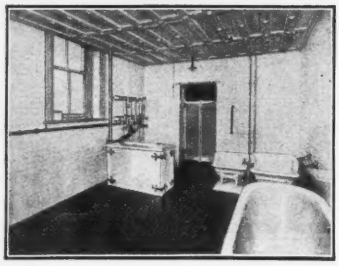

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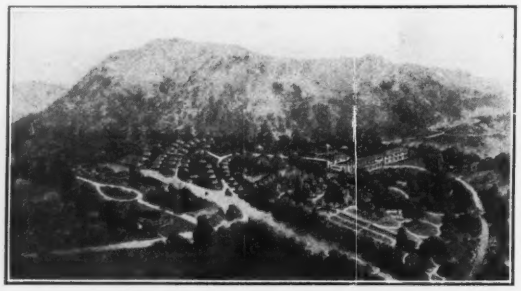

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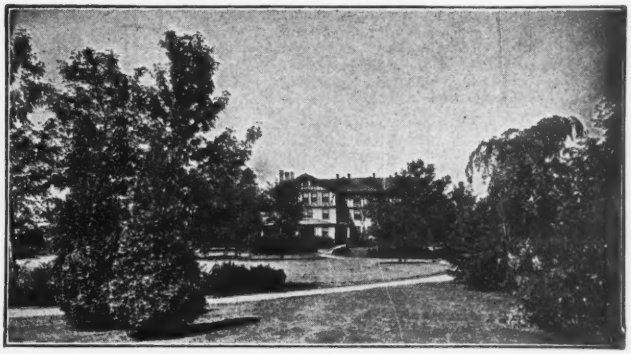

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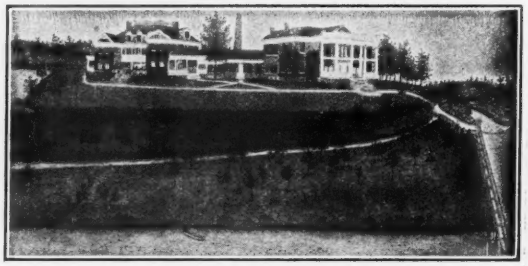

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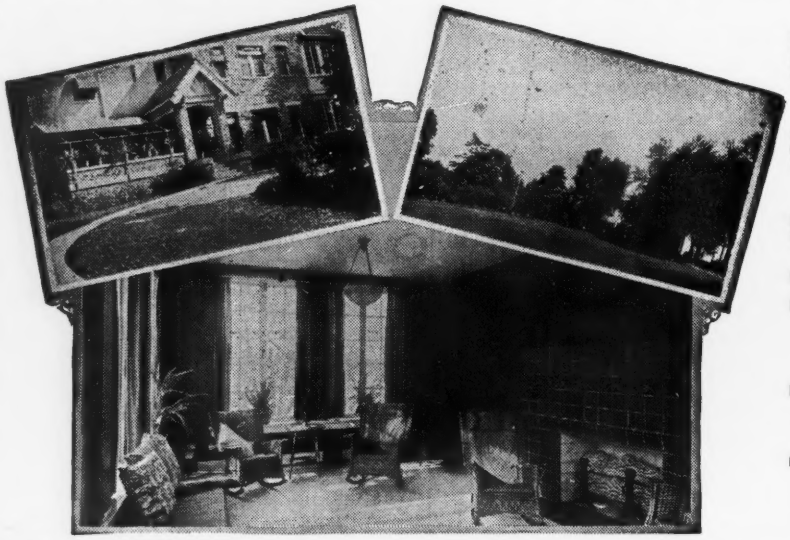

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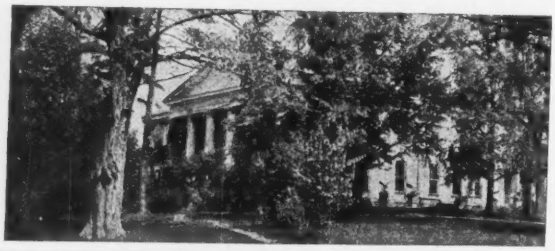

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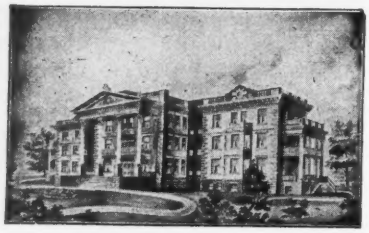

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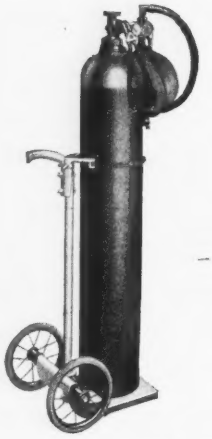

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INTESTINAL AMEBIASIS OF THE RAT AND MAN*†

By KENNETH M. LYNCH, M.D.,
Charleston, S. C.

In 1915 I[1] made a report concerning the possibility that the rat may act as a carrier of *Endameba histolytica*. This consisted of experimental transmission of the infection from man to the rat by feeding the rat on human stool containing the ameba, from rat to rat by feeding the stool from infected rat and by association of rats in the same cage, and also of the discovery of a natural infection of wild rats with an ameba indistinguishable from *Endameba histolytica*.

Lack of proper facilities prevented the showing of illustrations of the amebas and the intestinal lesions at that time, and circumstances have interfered with pursuit of the investigation since then.

Since this report, several investigators have confirmed and elaborated my observations. Brug[2] reported experimental infection of a rat with *Endameba histolytica* and also natural infection of two wild rats in Java. Kessel[3] was successful in transmitting *Endameba histolytica* and other amebas from man to rat and from rat to rat by feeding feces containing the amebas. Chiang[4] was able to infect white rats with *Endameba histolytica* of human origin by rectal injection of the trophozoites and by feeding material containing the cysts, and to prove the pathogenicity of the amebas recovered from the rat by rectal injection of kittens. This infection was readily transmissible from rat to rat by association in the same cage. He also discovered in laboratory rats a natural intestinal infection with an ameba agreeing very closely in its morphology with *Endameba histolytica* of human origin.

AMEBIC COLITIS

The colitis found in the rats of my study corresponds closely with that of intestinal amebiasis in man. The animals infected with *Endameba histolytica* of human origin developed an acute ulcerative colitis, with mucous diarrhea, this becoming evident in about two to four weeks. The stool was similar to that of human amebic dysentery, it being usually thick mucus streaked with blood and fecal matter. In this stool were numbers of active amebas, with blood and pus in varying amount. While there was general catarrhal enteritis, the ulcerations were limited to the cecum and first part of the colon. These ulcerations were of the typical amebic form, "moth-eaten," undermined, ramifying, with necrotic base and content, and they involved mucosa and submucosa. The tissues of the submucosa below were edematous and showed more or less leucocytic infiltration and young connective tissue formation. The extension of the ulcer was typically submucous. There was general excessive mucus formation by the epithelium of the mucosa.

Active amebas were found in the contents of ulcers. In sections of the intestine amebas were found within the depths of the mucous glands and scattered in the tissue spaces of the submucosa at the sides and below the ulcers. In none of the animals was further extension of the infection observed.

In rats carrying the natural infection with the ameba indistinguishable from *Endameba histolytica* the intestinal disease was evidently chronic. It conformed to the type which is coming into recognition as the more common form of intestinal amebiasis, as distinguished from the acute amebic dysentery. The stool of the animal was formed, there was no apparent diarrhea, and the animal was outwardly in normal condition. In two of these rats the ulcers were extensive, in five there were only a few

*Read in Section on Pathology, Southern Medical Association, Twenty-First Annual Meeting, Memphis, Tennessee, November 14-17, 1927.

†From the Department of Pathology, Medical College of the State of South Carolina.

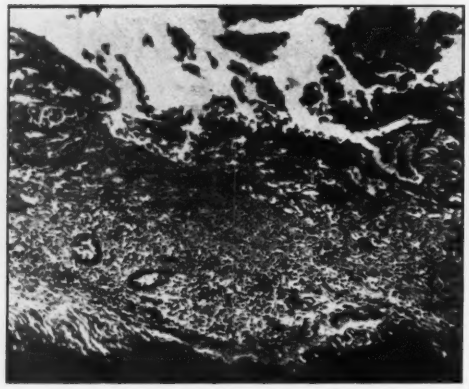


Fig. 1
Ulcer of colon of rat. Natural infection with Endameba histolytica.

small ulcers in the cecum, while in one rat the colon content contained the amebas but no evidence of tissue invasion by them was found. The small scattered ulcers of the cecum in the five above-mentioned rats resembled the ulcers of chronic human intestinal amebiasis. They were very small, rounded and practically confined to the mucosa. In the ulcer cavity the glands were partially or completely destroyed, the edges showing some grade of fibrosis. The amebas in the tissues about these ulcers were few and their extension was limited. In this connection it is noted that the nature of the intestinal disease induced by other investigators was of the chronic type. In some of the animals ulcers were found and in some there was none seen. It is to be noted, also, that their feeding material apparently came from chronic cases or symptomless carriers.

Whether the source of the amebas, that is, the habitual activity of the strain, governs the outcome of the infection, or whether the resistance of the host is the important factor, cannot now be told. It is significant, perhaps, that kittens succumb to acute disease by infection with amebas which produce mild or symptomless disease in man or the rat. I have had some thought of the relation of the diet to the disease, because of certain observations in my studies, but I have, as yet, been unable to carry the matter any further.

The pathology of the disease in these rats appears to be similar to that in the human being. There is apparently little or no surface invasion through the epithelial covering. The amebas seem to collect in the depths of the mucous glands and the invasion of the lower mucosa and the submucosa occurs from these nests. Whether they are able to penetrate a healthy and intact epithelial lining is questionable, although occasionally one is seen passing between two apparently living epithelial cells. From my observations it seems that the amebas are enabled to invade the tissues by virtue of destruction of the epithelium at the bottom of the glands. In the common case further extension is largely prevented, or takes place slowly, and we see the small quiescent ulcer and the non-dysenteric disease. We are not yet fully informed that *Endameba histolytica* lives in the intestine without invading the wall to some degree, although James and Deeks[5] state that invasion of the tissues is by no means constant. The fact that it appears to be able to survive as purely a lumen dweller in the rat, together with its growth in artificial culture, signifies that tissue invasion in man may not be obligatory and that we may have non-diseased human carriers.

In the less common acute form, that is, amebic dysentery, invasion of the wall of the intestine from the foci in the glands is allowed to occur more readily. Invasion is typically through the submucous coat and the lateral wandering of the amebas in this area is responsible for the characteristic undermined, "tunnelled" ulcer. Although the amebas occur commonly in the lymph spaces, the apparent lack of involvement of the lymph nodes of the mesentery or retroperitoneal tissues or of the follicles of

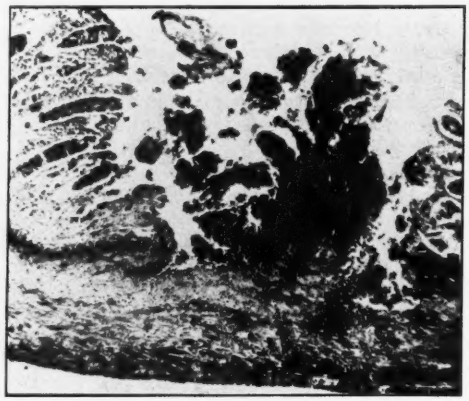


Fig. 2
Ulcer of colon of rat. Natural infection with Endameba histolytica.

Fig. 3
Ulcerative colitis of rat experimentally infected with Endameba histolytica.

the intestine wall is noteworthy. Amebic abscess of the spleen has been reported, although I have seen direct extension of a rupturing amebic ulcer of the adherent colon into the surface of the spleen without evidence of the ability of the amebas to invade the splenic tissue. Thompson[6] has recorded experimental infection of the rabbit in which she shows some invasion of the lymphoid tissue of the wall of the intestine. Kofoid[7] has found cells which have mitosis in division resembling that of *Endameba histolytica* in lymph nodes of Hodgkin's disease. In general, however, it seems that lymphoid tissue is resistant to this infection.

THE AMEBAS

As to the identity of the amebas recovered from these experimentally and naturally infected rats, morphologically they are indistinguishable from *Endameba histolytica*.

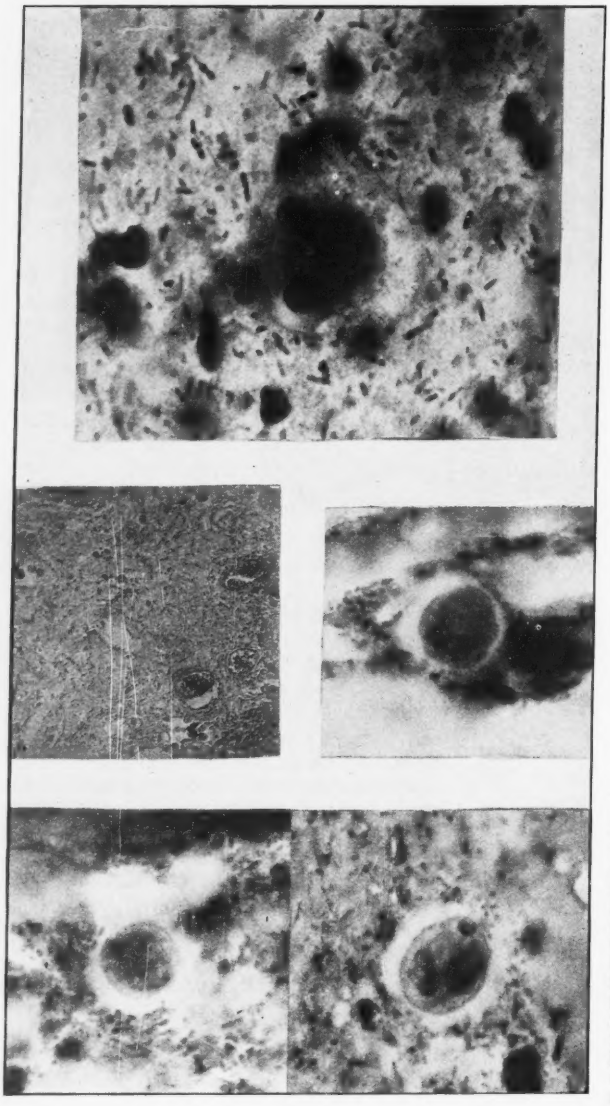
The trophozoites from the mucous stool and intestine of the acute disease and from the ulcers of the chronic, varied in size from 20 to 60 microns, the larger being from the acute disease. They had a distinct clear peripheral zone and a finely granular endoplasm which contained vacuoles in which red blood corpuscles were seen. The pseudopodia were long and finger-like or blunt and the movement of the ameba was of a rapid "flowing" nature when fresh and warm. It was upon these features, this ameba in a mucous stool associated with a typical amebic colitis, that my previous report based the identification of the ameba. There might have been the possibility of a mistake in judgment of the ameba alone, but probably not with the disease as a background.

With the application of the iron-hematoxylin staining method to such of my material as I could restrain, the trophozoite from the acute experimental and the chronic natural disease and the cyst from the rectal content in the latter fully satisfy the requirements for morphological identification of *Endameba histolytica*. Various of these specimens and tissue sections were shown in the scientific exhibits of the American Medical Association and the Southern Medical Association in 1922.

In stained specimens the trophozoite shows distinct ectoplasm, granular endoplasm containing no bacteria, small round nucleus with small central karyosome and small evenly distributed chromatin particles on the nuclear membrane. The cyst measures about 10 microns in diameter, contains four nuclei of the same type as the trophozoite, and, in some, a rod-shaped chromatoidal body is seen.

SIGNIFICANCE OF THE AMEBA AND DISEASE IN THE RAT

As a general rule each animal has its own distinct species of intestinal protozoa, and these species survive not at all or with difficulty in other animals. If the reason for this were known, the exceptions to the rule would, no doubt, be explained. The rat is an omnivorous animal and, as I have observed, will eat human feces even when other food is available. In many places this animal has access to human excreta and opportunity to contaminate human food and eating utensils. This opportunity is uncommon under modern housing and sanitary conditions, but there are many quarters where



(Top) Fig. 4. Endameba histolytica, containing red blood corpuscle, from stool of experimentally infected rat. X 1500.

Center left) Fig. 5. Amebas in the submucosa of colon of rat experimentally infected.

(Center right) Fig. 6. Cyst of Endameba histolytica, with single nucleus, from stool of naturally infected rat. X 1500.

(Bottom left) Fig. 7. Cyst of Endameba histolytica, four nuclei, from stool of naturally infected rat. X 1500.

Bottom right) Fig. 8. Cyst of Endameba histolytica, four nuclei and chromatiodal bar, from stool of naturally infected rat. X 1500.

the opportunity exists, and it is under such conditions that intestinal amebiasis is most prevalent and important. Whether the rat is an important means of disseminating the infection in nature can be determined only by extended study, especially in places where the conditions for such a method of transmission exist.

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DISCUSSION (*Abstract*)

Dr. F. M. Johns, New Orleans, La.—Dr. Lynch's communication revealing the presence of a protozoan parasite causing hemo-amebiasis in rats is worthy of more than passing consideration. The photomicrograms of the parasites found in these naturally infected rats show vegetated and encysted amebas that are morphologically identical with the diagnostic features shown by *Endameba dysenteriae*, and it is highly probable that the organisms found are really identical with the human variety of parasites. The fact that this disease is known to be transmissible to lower animals would raise the question as to whether these rats have not become accidentally contaminated. They may serve as temporary carriers rather than as chief sources of a disease that may be passed on from rat to rat. I do not know of any particular studies that have been made to determine the incidence of amebiasis in rats, but I do believe that a search should be instituted to determine the presence or absence of the widespread distribution of amebas in rats, and particularly with regard to the type similar

to *E. dysenteriae* in morphological and staining characteristics.

Amebiasis is one of the most widespread diseases that we have. It has always been rather difficult for me to believe that this widespread distribution is due entirely to direct fecal contamination from the carriers of our food and water. If the infection in rats is of common occurrence, this would certainly play a definite part in the spread of the disease. There are many places where rat contamination of foodstuffs is possible. I remember only recently having visited an old warehouse on the river front in New Orleans, where salad vegetables were packed for shipment to northern markets. No precautions were taken against rat contamination or proper toilet facilities for the ignorant class of workmen employed. It is readily conceivable that under these circumstances a (carrier) rat would play a definite role in the dissemination of this disease.

Dr. William Litterer, Nashville, Tenn.—This has a great public health significance. The rat, especially in country districts, will go into open privies and devour feces, as Dr. Lynch says, even in preference to other food. Rats will get in hotels, houses and apartment houses, and you cannot keep them out.

But this contamination in the cyst form is easy to kill. As Dr. Johns says, we should rat index as in plague, to find out just how many are infected in that way. The slides look typical of *Endameba histolytica* from the human. In fact, you cannot tell them apart. The mere fact that the condition can be carried from the human to the rat would lead one to believe that these are true *Endameba histolytica.* However, the ascaris in the hog is morphologically identical to that of the human, and yet it is a question whether it can produce ascarides in the human.

I should like to ask Dr. Lynch if rats are fed on human excreta, what per cent become infected? The majority, or just a few? Will these rats get rid of the disease spontaneously, or is tartar emetic treatment necessary to rid them of the disease?

Dr. Allan Eustis, New Orleans, La.—I should like to ask Dr. Lynch if the disease is also transmissible to mice? If such is the case, it appears to me that the danger of transmission to human beings is far greater from contact with mice than from rats, as the former are more frequently found in the average human habitation.

Dr. William H. Harris, New Orleans, La.—Is there any evidence of invasion in the liver?

Dr. Lynch (closing).—It is necessary to keep in mind that the importance of this depends upon whether it exists in nature.

Chiang's observation of this ameba in a laboratory strain of white rat raises the question of whether the rat has his own ameba of this type, indistinguishable from the human form morphologically.

Kessel finds young rats more susceptible to the infection. Older rats not so easily infected. Whether the rat is able to rid himself spontaneously of the disease I am unable to say.

As a rule, each species of animal has its own particular protozoa. I cannot say whether mice may be similarly infected.

I found no extension to the liver or outside the intestine wall, either in the experimental or natural infection.

NERVE INJURIES COMPLICATING FRACTURES*†

By R. WALLACE BILLINGTON, M.D., F.A.C.S., Nashville, Tenn.

In choosing this subject for my address to this Section, I am aware that some of our neurological surgeons may accuse me of encroaching upon their special field of surgery, and that many of you here may be too familiar with all that I can say, and more, on this subject, to find my remarks of interest. My excuse to the former is that I believe that we have more than a half interest in such cases and must frequently assume the whole responsibility for various reasons, while to the latter I can only say that many of the known facts relating to this subject are still unfamiliar to a large element of physicians who treat fractures. Moreover, I confess to using it as an excuse for showing you a patient with an operative result in which I take a certain degree of pride, pardonable, I hope.

Most of the present knowledge of peripheral nerve injuries, and likewise most of my own experience, is a result of the World War, during and since which a vast literature on the subject has developed. While there are certain differences between the usual injuries of war and those seen in civil practice, these differences make for better results in the latter if the same principles and technic of diagnosis and treatment be properly followed. The war injuries were usually associated with open wounds and infection, with more or less extensive destruction of tissues. This caused not only serious delay in the treatment of the nerve injury, but often rendered it difficult or impossible to restore a continuity of the nerve favorable for regeneration. Such conditions are much less common in the cases of civil life, so that, on the whole, we should be able to get quicker and better results.

The nerve most frequently injured in fractures is the musculospiral (radial), in fracture of the humerus. However, other bones from the scapula to the fingers and from the pelvis to the toes, with any or all of the neighboring nerves, may be subject to such associated traumatism. The fracture may be simple, comminuted or

*Chairman's Address, Section on Bone and Joint Surgery, Southern Medical Association, Twenty-First Annual Meeting, Memphis, Tennessee, November 14-17, 1927.

†From the Department of Orthopedic Surgery, Vanderbilt University.

Fig. 1
Permanent musculato-spiral paralysis with characteristic position of thumb and wrist-drop, before operation of tendon transplantation by author's technic.

compound, and the nerve may be damaged by the direct external violence, by compression or laceration by bone fragments, by callus formation, by infection, by compression from external splints or bandages, or from internal hemorrhage and swelling. Two or more of these influences may operate in a given case. If infection or a Volkmann's ischemic paralysis and myositis should occur, the treatment of the nerve would be more prolonged and difficult and the prognosis less favorable than in the absence of these complications. On the other hand, a nerve injury in the presence of a simple fracture is as easily handled in most cases as if there were no fracture. The mistake is often made of thinking that nothing can be done about the nerve until after the fracture has healed, if, indeed, the nerve injury is not altogether overlooked.

DIAGNOSIS

Let us, therefore, keep in mind the importance of an immediate examination for motor and sensory disturbance in the distribution of the nerves of the extremity distal to the fracture. An important point in both diagnosis and treatment is to know whether paralysis was present immediately after the injury or later. An accurate note of this should be made at the first examination of the patient. Progressive changes can then be noted from time to time.

If a nerve is found to be injured, we at once wish to know whether the injury consists of a contusion, which will require no surgical interference, or a severe crushing trauma, or a partial or complete severance of the nerve, any of which will demand early surgical exploration if the condition of the tissues will permit. Unfortunately this differentiation cannot always be made by a clinical examination. Even a moderate contusion of a nerve trunk may cause total loss of motor and sensory function which cannot be distinguished from complete severance except by exposing the nerve surgically or by waiting for two or three months for signs of returning function. Even then a partial return of function may mean partial severance and not a simple contusion.

The determination of motor and sensory loss, partial or complete, and of returning function require considerable special knowledge and experience in this work. Every muscle supplied by the suspected nerve distal to the point of injury should be carefully tested for response to voluntary effort and, if this be absent, to faradic and galvanic stimulation. The electrical reactions of degeneration in a muscle do not appear until two or three weeks after even a complete nerve section, so that during this period the usual electrical tests are of little value. Even when these reactions do appear after this period they may be due merely to a contusion. In most cases it is advisable to wait for three weeks after the injury before operating until the reaction of degeneration develops. If degeneration fails to show in this time, one may wait longer for it, or for the signs of returning function. But when this reaction does appear, which is usually from 10 to 20 days after injury, if at all, one should at once consider an exploratory operation.

Sensory tests consisting of response to light touch (epicritic), pin prick (protopathic), heat and cold, also Tinel's sign of formication, which is a creeping sensation in the distribution of the nerve produced by light percussion over the

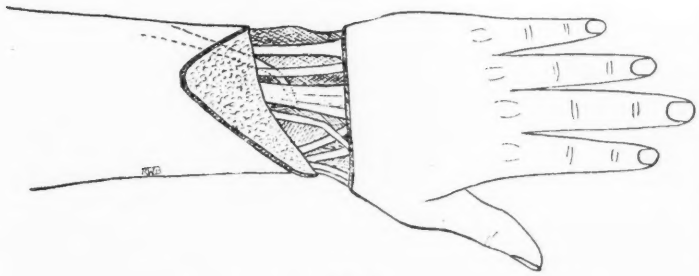


Fig. 2
Showing exposure of tendons at the back of the wrist and the position of the flexor carpi ulnaris tendon after insertion into the finger extensors.

nerve just below the point of injury, all require much time and careful observation and interpretation. If either motor or sensory loss is only partial during the first few days, and if the reaction of degeneration does not develop within three weeks, this usually means a mild contusion, which will rapidly recover. If the nerve trunk is even partially severed, there is usually enough contusion of the uncut fibres to result in total paralysis for several weeks before any signs of returning function. Progressive paralysis, developing after the injury, not simultaneous with it, means pressure from hemorrhage, swelling, splints or tight bandages, if it occurs within the first few days. If later, one should suspect scar contraction or callus impingement.

The type and severity of the trauma, the presence of an open wound, the particular nerve involved, whether it lies close to the bone or skin, or is well protected by surrounding soft tissues at the point of injury, and the possibility of exploration without serious damage to branches and other soft tissues are all points to be considered in weighing the probabilities as to mild or severe injury to nerve and the advisability of operation.

The early signs of nerve regeneration, according to Stookey, are formication (Tinel's sign), shrinkage of areas of anesthesia from proximal toward distal portions of the limb, return of deep sensibility to pressure and of muscle tone and sensibility. Return of voluntary muscle power and faradic excitability are late signs. The early diminution in size of anesthetic areas does not necessarily mean recovery in the injured nerve. It is thought to be due to extended innervation from the surrounding healthy sensory nerves. If Wallerian degeneration has taken place in the peripheral segment, the first of these signs usually appears within two or three months where conditions are favorable for regeneration.

TREATMENT

This will, of course, depend on the amount of damage to the nerve. If it is not extensively crushed or severed, there will be a rapid return of sensory and motor function within one to three months. Some advise waiting for three months or longer in all cases before operating. There are serious objections to this rule. It is proven by the statistics of Platt and others that in general the earlier an operation for suture or neurolysis is done, the better and quicker the result, although the first two or three weeks probably make very little difference. If one waits three months before suture of a partially or completely severed nerve, valuable time has been lost. Moreover, signs of recovery after a two or three months' period do not exclude a partial severance and would encourage serious further delay of operation, which is necessary to complete recovery. Another objection to delay is the increasing density and amounts of scar and neuromatous tissues about the severed nerve ends which render operation more difficult. When there is no open wound or infection present, it is a good general rule to explore a nerve in two or three weeks after injury, provided there is total motor and sensory paralysis and

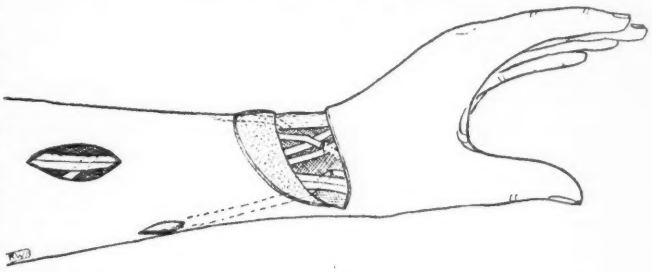
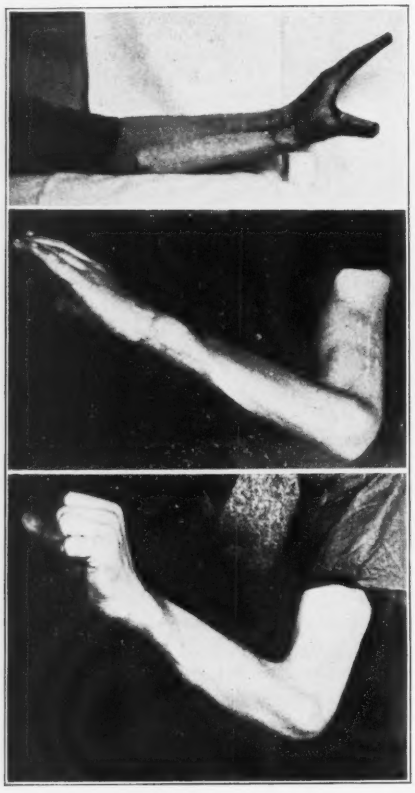


Fig. 3
View of all three incisions from the radial aspect. Note arrangement of transplanted pronator radii teres and flexor carpi radialis.



Top—Fig. 4. Proper position of wrist, fingers and thumb after operation, maintained by a special cockup splint.

Center—Fig. 5. Active extension of fingers and wrist after operation. Notice active, transposed flexor carpi ulnaris. Scar on upper arm due to neurolysis operation two months after fracture of humerus.

Bottom—Fig. 6. Active extension of wrist, complete, with fingers flexed, after operation. Thumb remains free of flexed fingers.

the reaction of degeneration has appeared. If the nerve is easily accessible, as it usually is if distal to the level of the pelvis or the clavicle, there is practically no danger from a careful exploration.

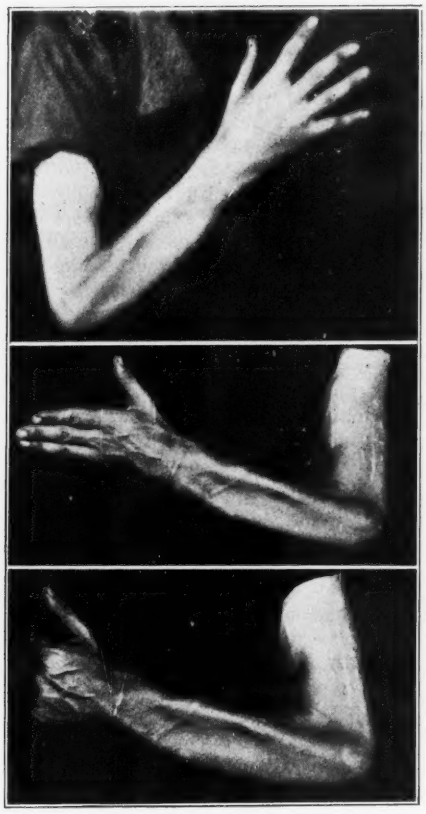
If the fracture is compound or the skin shows abrasions or infection, it is unwise to explore the nerve until a month or longer after healing of soft tissues is complete. But if a debridement is necessary, the nerve should be carefully preserved and sutured, if exposed in the wound. Fortunately in civil practice infected wounds and extensive destruction of soft parts are not nearly so frequent as in war injuries. For this reason we may expect better results from cases requiring operation and suture.

A serious type of nerve injury is that which is often associated with Volkmann's ischemic paralysis. While the essential muscle pathology in this condition is not due to nerve injury, as shown by the experimental work of Barney Brooks, it is true that there is often present considerable damage to the median or ulnar nerves, or both, due to the acute ischemia and the resulting fibrosis and contraction of surrounding tissues. Our former chairman, Dr. Frank Dickson, reported before this Section some very favorable results of neurolysis or freeing of the median and ulnar nerves in such cases. While this operation may be frequently advisable, especially where there are marked sensory changes, it must be remembered that more or less spontaneous improvement, especially with proper splinting and physiotherapy, occurs in most of them without operation.

The technic of neurolysis and suture is now fairly well standardized. Expose by a long incision, locating the nerve above and below the point of injury, then by careful, sharp dissection free the damaged portion, being careful to preserve any branches given off in this region. The nerve should be thoroughly inspected and tested for conductivity by a very weak faradic current applied above, at and below the point of injury. If it is intact and does not appear extensively crushed or lacerated, it should be shifted to a bed of healthy tissue, preferably between muscles, away from scar tissue, and left alone to await recovery. No artificial sheath of fascia, fat, Cargile membrane or other substance should be employed.

If only a portion of the nerve fibres has been severed, these should be sutured without resecting the uncut portion. If the nerve trunk is found completely divided, or, in the old cases, if it contains much fibrous tissue and shows little or no signs of regeneration or conductivity, a complete end-to-end suture should be done, being sure to resect all scar tissue and neuroma from the ends before making the anastomosis. Axial rotation should be avoided as far as possible by study of the pattern of the bundles in the cut ends and by marking corresponding points on the sheaths before freeing the two ends. Use interrupted sutures of fine linen or silk, including only the sheath and making as perfect an anastomosis as possible.

Where the ends are found separated and when resection of a considerable portion of damaged



Top—Fig. 7. After operation. Thumb and fingers extended and separate.

Center—Fig. 8. After operation. Notice full active extension of thumb and fingers with wide "grasp." Atrophy of extensor muscles is complete.

Bottom—Fig. 9. After operation. Notice full active extension of thumb while fingers are flexed.

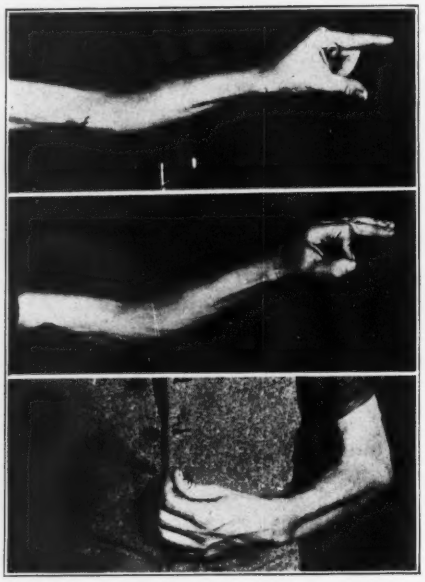
nerve is necessary, approximation is usually possible if neighboring joints are flexed or otherwise placed to give the greatest amount of slack. A two-stage operation with gradual stretching of the nerve for two or three weeks after the first stage is sometimes necessary, as is also transposition of the nerve, particularly the ulnar, at the elbow. Bridging gaps by nerve transplants and other substances has proven of little practical value. Hemostasis should be complete before closure of the wound. Also be sure to remove enough of the scar or neuromatous tissues from the cut ends, so that there is left no obstruction to the growth of axis cylinders from the proximal into the distal segment.

One of the most important features of treatment is proper splinting of the limb, both before and after operation, if there be an operation, in order to prevent stretching of weak or paralyzed muscles and the development of contractures and deformities. Such splinting can usually be combined with that necessary to the proper treatment of the associated fracture. Prolonged physiotherapy measures until recovery is as complete as possible should be employed, but it should be remembered that massage that is too heavy and electrical stimulation that is too strong will damage and fatigue the muscle fibres, thus doing more harm than good.

Unfortunately 25 to 50 per cent of all nerve injuries, including a considerable proportion of those treated under the most favorable conditions, fail to make a satisfactory functional recovery. If after nine to twelve months following the operation on the nerve, it becomes evident that regeneration is not going to be sufficient to restore good function to the affected limb, it then becomes necessary to consider what other measures, if any, will further improve its usefulness in spite of the irreparable injury to the nerve. Too often the patient is here left to his fate as a cripple without further help or the knowledge that anything more can be done for him.

The other measures which may prove beneficial, and often extremely so, are tendon transplantations, arthrodesis, or other stabilizing bone operations and permanent splints and braces. Occasionally amputation of a leg and substitution of an artificial limb is the best possible solution.

Musculospiral (radial) paralysis is the most frequent of such conditions, and it is fortunate that very gratifying results can be obtained by tendon transplantation. I have devised a technic which may be considered a modification of the Jones-McMurray operation, which has given me excellent results in about a dozen cases. I described this operation in detail in the *Journal of Bone and Joint Surgery*, July, 1922. I am presenting for your observation a patient on whom this operation was performed about eighteen months ago. I wish you to note especially the excellent function of the thumb, entirely independent of the action of the index and other fingers. It is in the arrangement of the tendons to the thumb and index fingers that my plan differs from that of Jones and McMurray, several of whose operations and after results I had the pleasure of seeing in Liverpool in 1917 and



Top—Fig. 10. After operation. Notice active, transposed flexor carpi radialis now extending the thumb, also extension of wrist and index while other fingers are flexed.

Center—Fig. 11. After operation. The thumb is opposed to index finger while others are extended.

Bottom—Fig. 12. After operation. Patient is buttoning his vest with affected hand. There is very little impairment of function.

1918. I shall not repeat the detailed description here, but refer those interested to my paper above mentioned.

In median paralysis affecting only the thenar muscles, the function of the thumb is seriously impaired, and it may be greatly improved by arthrodesis at the first carpo-metacarpal joint, fixing the thumb in abduction and palmar rotation, or, preferably, by tendon transplantation after the method of Steindler. If the injury is high enough to paralyze its forearm muscles, the tendons of the supinator longus and flexor profundus digitorum may be attached to flexors of wrist and fingers with some benefit.

Ulnar nerve injury, which offers poor results from nerve suture, fortunately leaves a fairly useful hand, even if total paralysis persists. The profundus tendons to the ring and little fingers may be attached to those of the index and middle fingers with helpful results where the median is not involved.

Musculo-cutaneous nerve injury is rare, and even with total paralysis of the biceps and brachialis anticus muscles flexion of the elbow is still possible, though weak, due to action of the supinator longus (bracho-radialis). This action may be strengthened by Steindler's operation of transferring to a higher level on the humerus of the internal epicondyle with its attached conjoined tendon of the forearm flexors.

Sciatic paralysis, except from gunshot wounds, is a rare complication of fractures of the femur. When permanent, this leaves a dangle-foot, often with serious trophic changes, pressure sores and painful causalgia of the foot, which may necessitate amputation. Usually, however, an ankle brace or stabilizing operation will improve function. Paralysis of the internal popliteal and posterior tibial nerves causes similar difficulties which are handled in much the same way.

External popliteal (peroneal) paralysis, resulting in drop-foot deformity, may be greatly benefited by fixation of the anterior tibial and peroneal tendons to the tibia (though the deformity may recur), or by a simple drop-foot brace. Tendon transplantations in the lower extremity are much less satisfactory than in the upper.

In conclusion, the points which I wish to emphasize most are:

(1) In all fractures an early examination for nerve injury should be made.

(2) If evidence of a nerve injury is found, a thorough neurological examination of it should be made at once and repeated every few days to determine its extent and progress.

(3) If at the end of three weeks there is total loss of motor and sensory function and the muscles show the reaction of degeneration, the nerve should be explored without further delay in most cases.

(4) Proper mechanical and physical therapy should be employed from first to last.

(5) Even when partial or complete failure of nerve regeneration occurs, function may be often improved or restored by skillful use of orthopedic operations and appliances.

426 Doctors' Building.

CONTUSIONS AND SPRAINS*

By ISIDORE COHN, M.D., F.A.C.S.,†
New Orleans, La.

When the diagnosis, sprain or contusion, is applied to an injury which results from trauma it is presumptive, by which I mean that much is taken for granted. The surgeon assumes that only soft tissue damage has occurred. Often this assumption is made without due investigation by those scientific measures which are at our command. Such carelessness cannot be justified. This is well illustrated in a damage suit quoted by Scudder in the last edition of his work on "Fractures." Under "Diagnosis and Treatment of Fractures as Sprains," he reports the case of Nickerson vs. Gerrish, in which the court awarded $5,000.00 damage in favor of the plaintiff. The basis of the decision was that the

"mistake was the result of a failure of the defendant to use painstaking care and diligence and to exercise the best of his admitted learning, skill and judgment in his examination and treatment of the plaintiff's injuries."

It is interesting to note the frequency with which the term is applied to what seem originally to be simple injuries, some of which in the course of time become serious and demand active intervention.

Modern textbooks barely mention the term; medical journals for the past few years have contained few references to them. In fact, one would think that surgeons did not see so-called sprains from the infrequency of reference to them in the literature.

How is it then that many surgeons and general practitioners are willing to assume that an undefinable and hypothetical condition exists frequently? They seem to overlook the fact that these cases, when unrelieved, find their way to someone who is willing to make a careful investigation in order to determine just what has happened.

The modern attitude towards sprains may be said to have had its birth in Philadelphia. The pioneer work of Ross and Stewart has been of inestimable value. Their announcement in 1912, "The word sprain standing alone we eliminate," fell like a bomb on the camp of the indifferent who had complacently treated many for this hypothetical injury.

Unfortunately surgeons as a group feel like Sir W. Bennett, who apologized for discussing the subject in the following words:

"Unless I had been asked to do so I should not have presumed to contribute to the *British Medical Journal* an article upon such a trivial subject as sprains."

One need not apologize for speaking about a term which might almost be eliminated had not custom dignified its use.

The term sprain conveys the impression that the ligaments have been lacerated. Ross and Stewart have provided experimental proof that the ligaments have greater tensile strength than the bony prominences to which they are attached. When a joint is forced to describe a greater arc than its normal range of motion we may expect a fracture rather than soft tissue damage alone. This fact has been appreciated, in regard to fractures of the greater tuberosity of the humerus, for a long while: to such an extent that some authorities deny the existence of this injury without a dislocation of the shoulder.

A diagnosis of sprain is not justifiable unless one can convince himself, by every possible means, that a fracture does not exist.

The conception of a ligamentous tear is purely hypothetical. No one dies of sprains, and operations are not done for the relief of sprains. However, where careful examinations are made, one can determine the existence of a fracture in most instances.

It will further be our purpose to show cases where the diagnosis of sprain was made, in which later because of the persistence of pain and the existence of deformity or disability, the patient applied for treatment and fractures were found.

It is equally true that the diagnosis of fracture will often be made by those who do not appreciate the normal appearance of the developing epiphysis. A knowledge of this subject is essential to the management of injuries about the joints in children.

No part of the body is exempt from injury, so we find use of the term contusion applied to injuries in those parts of the body where joints are not easily sprained. The head, back and long bones come in for this diagnosis too often, much to the discredit of the profession. The following cases illustrate this point:

Case 1.—Miss W. C., age 21 years, had a linear fracture of the skull in the left temporal region.

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*Clinic, General Clinic Session, Southern Medical Association, Twenty-first Annual Meeting, Memphis, Tennessee, November 14-17, 1927.

†Professor Clinical Surgery, Tulane University; Associate Senior Surgeon, Touro Infirmary.

She had been in an automobile accident eight weeks before she came under our observation. Her injury had been diagnosed as contusion of the head, although she was unconscious for one and one-half hours following the accident. She returned to her teaching position ten days later.

She suffered from persistent headache and numbness on the left side of her face. She was not conscious of disturbances in vision.

On examination we found pain over the left zygoma. Examination of the eye grounds showed an edema of the papillae in both eyes. X-ray examination showed a linear fracture of the skull in the left temporal region.

Spinal tapping revealed a manometric reading of 26.

Because of the persistence of her headaches and the edema of the papillae following repeated tappings it was necessary to do a decompression operation.

The patient was entirely relieved of headaches and the edema of the papillae subsided.

It is now two years since operation and the patient has been teaching almost continuously for the last one and one-half years.

Case 2.—Master W. W. had a fracture of the skull. He jumped across a ditch and struck his head. He was taken to an emergency clinic where he was treated for a small brush burn on the forehead. Within one and one-half hours of the accident the child was unconscious.

Immediate spinal tapping, x-ray examination, and examination of the fundus was done. The eye grounds were negative. X-ray pictures revealed a fracture of the skull, and the spinal manometric reading was 22. A clear spinal fluid was obtained.

The child became conscious within five minutes after the intracranial pressure had been reduced by spinal tapping. Repeated tappings were done, and magnesium sulphate was administered by mouth and by rectum. Rest in bed and ice bags were used.

Under this regime the child steadily improved. He left the hospital within two weeks of the accident with no evidence of trouble.

Can you imagine the anxiety of the mother who had been told that her child's injury was of minor significance when she saw the unconscious form before her two hours later?

Fig. 1
Master W. W.: Fracture of skull.

All patients suffering from head injuries should be carefully observed for pupillary changes, blood pressure elevation, and signs of increased intracranial pressure. We might add here that changes in the fundus are not to be expected early, and certainly should not be relied upon as evidence that increased tension does not exist. X-ray pictures will often give valuable data, but it should also be kept in mind that a fracture of the skull, which has produced an increased intracranial pressure, may escape observation on the part of the roentgenologist.

Spinal manometric reading should always be made if there is the slightest doubt. It should be remembered that the reading under an anesthetic is not as reliable as one taken when the patient is awake.

The diagnosis of contusion in some of these cases may produce serious end results as in the case of Miss W. C., who was progressively going blind and suffering untold agony from headaches. These mistakes are avoidable, but only if the surgeon exercises the greatest care in the early handling of the case, and eliminates the word contusion from his diagnosis until he has eliminated everything else.

Injuries of the face are often diagnosed as contusions when a fracture of the nose or a fracture of the zygoma exists. Sometimes the diagnosis of contusion of the face is made by the patient and sometimes by the physician. When a patient makes such a diagnosis it is a reflection on the local medical profession because the patient must have gotten his impression from some of the profession.

Case 1.—Master G. had a fracture of the nasal bone without deformity.

The child was accidentally kicked on the nose by another boy when he stooped to tie the lacing of his shoe. The mother brought the child to the office not because she thought any serious accident had occurred, but as a prophylactic measure.

The nose was swollen particularly on the right side. There was no bleeding from the nose. Both sides could be palpated without causing pain. There was

no edema of either lip, no pain on palpation over either antrum, and no respiratory difficulty.

X-ray was taken as a precautionary measure. This revealed a comminuted fracture of the nasal bone without deformity.

Case 2.—Mr. W. had a fracture of the zygoma.

He was struck on the side of the face with a baseball. He believed that he had just a contusion of the cheek, but consented to examination.

On examination we found a depression over the midportion of the left zygoma. There was tenderness over this area. Diagnosis of fracture of the zygoma was made. X-ray pictures were requested, and confirmed the diagnosis.

Operation proved the presence of a depressed fracture. He obtained complete relief from pain, and the deformity was overcome entirely.

Case 3.—Mr. D. F. had a fracture of the zygoma.

The patient received the injury by jumping over a barricade which fell with him. He came in five days after for examination because he thought the condition was a simple contusion.

Complete relief was secured by operative reduction.

If untreated these patients have a definite deformity and persistent pain. Early proper management will save future trouble.

Injuries of the back are often spoken of as contusions. Two cases are cited here as illustrations of this point.

Fig. 2
Mr. A.: Fracture of second and third lumbar vertebrae.

Case 1.—Mr. A. had an old fracture of the second and third lumbar vertebrae.

During April, 1926, the patient was struck by an automobile. He received no medical attention for three weeks because he was able to be about in spite of pain on the right side.

Examinations and x-ray studies revealed an old fracture of the second and third lumbar vertebrae.

Application of a plaster jacket completely relieved his pain and enabled him, after a period of several months, to return to his ordinary activities.

Case 2.—Mr. Q. R. had a fracture of the sacrum.

After an automobile accident several months before he came under our observation. He had been treated for contusions of the back. Obtaining no relief he sought further investigation.

X-ray examinations showed a fracture of the sacrum. Pain was relieved by treatment.

In neither of these cases had x-ray pictures been taken originally. One patient was given everything from aspirin to anti-luetic treatment without relief of symptoms. An x-ray picture taken for one surgeon was reported as showing no evidence of bone injury.

When he came under our observation careful examination was made and pictures revealed a fracture. His symptoms were relieved by a plaster jacket.

The second patient was relieved by proper local immobilization.

There are several instructive points to be learned by a study of these cases.

(1) The diagnosis of contusion is not justified unless everything else is eliminated.

(2) Proper investigation will reveal a greater frequency than is expected of fracture of the transverse processes, incomplete fracture of the vertebral bodies and sacral injuries.

(3) Early and careful examination with detailed records of our findings will eliminate many damage suits.

(4) Patients will suffer less permanent disability if their conditions are properly treated in the early stages.

So-called contusions of the leg often prove to be incomplete fractures.

Case 1.—Mr. E. J. L. had an incomplete fracture of the tibia.

While doing gymnastic work he struck the leg against a piece of wood. He was seen by physicians immediately who ordered turkish baths, application of hot compresses and massage. This did not satisfy the patient who phoned me to meet him at Touro. He told me that he had a broken leg.

Fig. 3
Mr. E. J. L.: Incomplete fracture of tibia.

Examination revealed brush burns on the leg and a painful area about the middle third of the leg. There was no limitation of motion of the knee or ankle.

X-ray pictures revealed an incomplete fracture of the middle third of the tibia.

Immobilization and after care, as for fractures, resulted in a perfect recovery.

Case 2.—Mr. A. H. suffered from an incomplete fracture of the fibula.

He had jumped off a moving train and struck his leg.

Examination revealed pain over the lower third of the leg on the outer side. X-ray pictures revealed an incomplete fracture of the fibula.

He recovered without disability.

COMMENTS

These cases are not peculiar or unusual. They represent a group in which injury has not been sufficient to incapacitate the individual immediately, but local pain should direct our attention to the fact that some bone damage must have occurred.

During the fall and winter season it is important to look out for these injuries. A zealous football coach may insist that a player has a "streak of yellow" if he complains bitterly of pain when the coach thinks nothing but a contusion is present.

JOINTS INJURED

So-called sprains which are in most instances sprain fractures are found in the vicinity of the joints.

Shoulder injuries when associated with pain, limitation of motion, but no evident deformity, may on investigation prove to be fracture of the greater tuberosity of the humerus, or fracture of the body of the scapula or glenoid fossa. These injuries are by no means infrequent.

When a patient is examined the surgeon should always try to interpret the limitation of motion in terms of the muscle origin, insertion, and action.

Loss of external rotation and abduction with pain over the greater tuberosity should suggest a fracture of the greater tuberosity.

Loss of abduction, internal rotation of the arm and pain over the body of the scapula suggests a fracture of the scapula.

These cases will recover without disability if treated early. If allowed to go untreated there will be a permanent limitation of motion of the shoulder.

Case 1.—Miss L. G. suffered a fracture of the greater tuberosity of the humerus.

She fell and was brought to the emergency clinic where a diagnosis of sprain of the shoulder was made. Since that time she had been in pain and unable to move her arm.

On examination we found the right shoulder lower than the left. The arm seemed to be rotated inward. There was obliteration of the pectoro-deltoid groove, no apparent alteration in the contour of the clavicle. The contour of the shoulder was not altered. There was no pain over the clavicle at any level. There was some pain over the coracoid process. There was pain over the body of the scapula. The head of the humerus was in the glenoid fossa and there was pain over the head of humerus. Rotation, particularly outward, was painful. Abduction was painful and limited.

X-ray examination was requested of the right shoulder for possible fracture of the tuberosity or body of the scapula close to the glenoid fossa. The picture corroborated the diagnosis.

Case 2.—Mr. D. W. had a fracture of the greater tuberosity of the humerus.

On March 16, 1913, while trying to step from a moving car he fell to the pavement. He was referred to me on March 24. During the week following the accident the patient noticed that he was unable to use his arm or abduct it.

Examination revealed marked ecchymosis of the arm. There was loss of contour of the shoulder joint. He held his arm close to his body, the arm rotated inward. He complained of severe pain over the greater tuberosity of the humerus. He had limitation of motion of the shoulder, especially external rotation. In fact, he was unable to rotate the arm voluntarily to any degree, and passive external rotation and abduction was painful. A diagnosis of fracture of the greater tuberosity was made and the x-ray confirmed the diagnosis.

Case 3.—Mrs. C. H. had a fracture of the body of the scapula.

The patient fell in the basement and thought that she had sprained her shoulder. There was pain when she moved her shoulder.

Examination revealed no change in the contour. The arm was abducted. Abduction and internal rotation increased pain. Rotation of the shoulder proved that the head moved with the shaft. Palpation of the body of the scapula below the spine caused pain.

The x-ray confirmed the diagnosis of fracture of the body of the scapula.

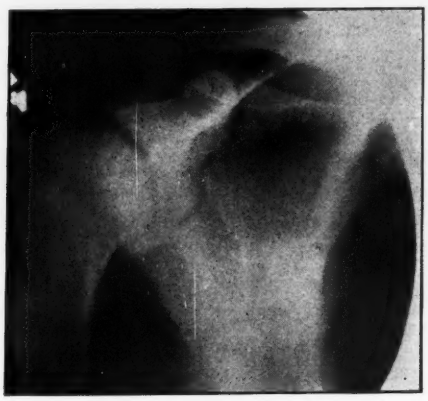

Fig. 4
Mrs. C. H.: Fracture of body of scapula.

Elbow injuries come in for a fair share of attention because of undiagnosed epiphyseal fractures in children and fractures of the head of the radius in adults.

Case 1.—Baby M. B. fell on the left arm about four weeks before I saw him. He was taken to an institution where x-ray pictures were taken and the mother was told that "there was no evidence of a fracture, but the child had a sprain. The x-ray showed no break or dislocation."

One week before she came to me the mother noticed that the child was unable to use his elbow. So far as she could make out there was evidence of deformity and for that reason she consulted a physician who advised further examination of the child.

The child came under our observation September 14, 1927. We found loss of the carrying angle, and marked prominence on the outer side of the elbow. The external condyle was on a lower level than the internal

Fig. 5
Baby M. B.: Old fracture of lower end of humerus.

condyle. There was a definite depression below the internal condyle. There was limitation of flexion of the elbow, and extension beyond 110° was impossible.

An x-ray was requested. The true state of affairs could easily be seen. There had been a fracture with complete dislocation of the epiphysis of the lower end of the humerus as will be seen in the accompanying pictures.

It was necessary to operate in this case in order to reduce the deformity.

The usual external lateral incision was made exposing the radial nerve. The radial nerve was retracted forward and the triceps backward. The fibers of the brachial radialis were divided, thus exposing the capsule. The capsule was incised with consequent exposure of the external condyle or lower epiphysis.

The shaft of the humerus was anterior to the lower epiphysis, and there was complete backward displacement. A skid was introduced between the shaft of the epiphysis and the humerus. The callus of the end of the shaft was removed. The callus on the end of the epiphysis was removed. Some shaving down of the epiphysis was necessary in order to permit us to return it to its normal position.

We then found it necessary to use some form of fixation so that the epiphysis would remain in contact with the diaphysis. The simplest method that we could think of was to make a drill hole through the epiphysis and one in the diaphysis. One kangaroo tendon was

introduced. The fibers of the brachial radialis and the capsule were sutured over the shaft. The skin was closed, and the elbow placed in a position of hyperflexion.

At the present time (November, 1927) there is no deformity. Supination and pronation are not limited. He can flex the elbow with ease and extend it to about 160°.

The error in this case was due to the inability of the original examining physician to interpret an x-ray of an elbow of a child. If he had known that the capitellum was not in its proper place he would have immediately anesthetized the child and the operation which I had to do one month later would have been avoided. Many such cases could be introduced.

Another type of fracture in children is infrequent, and is often wrongly diagnosed.

M. F. had an injury of the elbow, with localized pain over the upper portion of the ulna. X-ray pictures revealed a complete fracture through the olecranon into the sigmoid cavity. This might easily be mistaken for a normal epiphysis unless one recalls that the olecranon does not begin to ossify until about the ninth or tenth year.

Fig. 6
M. F.: Fracture of ulna through olecranon.

Fractures of the head of the radius in adults occur with sufficient frequency to warrant particular attention, and many of them are overlooked and passed as sprains. If there is no displacement we have only a limitation of pronation and supination in some cases, and possibly a limitation of extension.

Case 1.—Miss M. C., age 13, had a fracture of the head of the left radius. She fell and struck her elbow against the edge of the curbing. There was pain, and inability to use the arm.

Examination revealed a swelling of the elbow most marked over the anterolateral aspect. The elbow was held in a position of flexion. Any movement caused pain. Palpation was particularly painful over the head of the radius. Rotation of the head of the radius with the shaft revealed crepitus.

Case 2.—Mrs. J. had a fracture of the head of the radius.

September 17, 1920, about six weeks before I saw her, the patient had a fall. The examining physician told her that she had loose joints and nothing need be done for this condition.

Examination revealed limitation of flexion and extension. There was pain over the head of the radius and crepitus when the examining thumb was placed over the head of the radius and the forearm pronated and supinated.

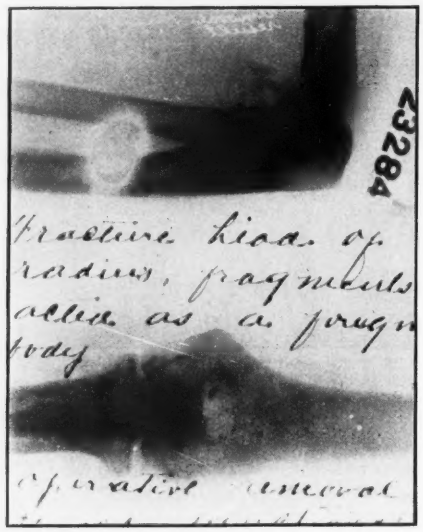

Fig. 7
Mrs. J.: Old fractures of head of radius.

X-ray pictures revealed a number of small fragments of the head of the radius lying anterior to the normal position of the head.

The loose fragments were removed by operation. The capsule was not entirely closed and the patient instructed to exercise the elbow. The Wilms' principle of treatment was followed. The result is a perfect functioning elbow.

Case 3.—Miss D.'s condition was due to a fracture of the head of the radius and coronoid process of the ulna.

She fell and struck her elbow. She had pain over the head of the radius, and limitation of extension.

X-ray revealed the fracture mentioned.

The end result was a perfect functioning joint.

Fig. 8
Fracture of head of radius.

Fig. 9
Fracture of head of radius.

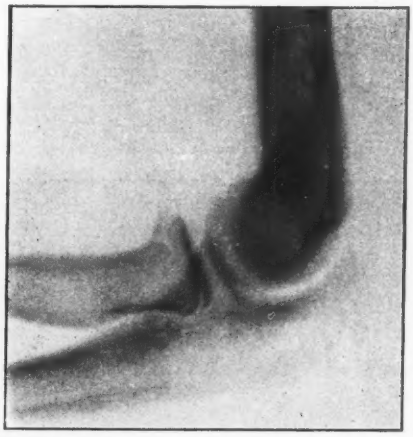

Fig. 10
Fracture of head of radius.

Sprain fractures of the head of the radius are of importance because the loose fragment may act as a foreign body to limit motion. A more satisfactory prognosis can be given if the diagnosis is made early. Later when pronation and supination are limited, and the patient seeks relief, he cannot be assured of a perfect result.

Early diagnosis will shorten the period of disability, diminish the pain and avoid the necessity of operation.

SPRAIN FRACTURES OF THE WRIST

Sprain fractures of the wrist include fractures of the carpal bones. Reference to these injuries is made in detailed manner in a paper on fractures of the base of the radius.

Sprains of the knees may prove to be fractures of either condyle of the femur, fracture of the head of the tibia, sprain fracture of the patella and fracture with dislocation of the semilunar cartilages.

Case 1.—Mr. Z. had a fracture of the internal condyle of the femur.

He was struck on the knee while unloading a truck, and treated by a physician first for a sprain, and later for a "dislocated nerve." He applied to the clinic for treatment, at which time it was found that he had some flexion of the knee over the internal condyle and some hydrarthrosis of the knee. An antero-posterior view as well as a lateral view of the knee was requested, but for some reason the antero-posterior view was not taken and a report of "negative to bone changes" was made. A subsequent lateral view revealed a fracture of the internal condyle of the femur. The loose fragment was removed, the wound healed without trouble and the patient recovered the ability to flex and extend the knee. The last time he was seen

the weight-bearing power was perfect and the motions of the joint were not impaired.

Case 2.—Miss J. McD. had a fracture of the patella. The patient gave a history of injury to the knee, and there was a localized pain on the outer side of the patella and nowhere else.

X-ray revealed a small chip fracture on the outer side of the patella.

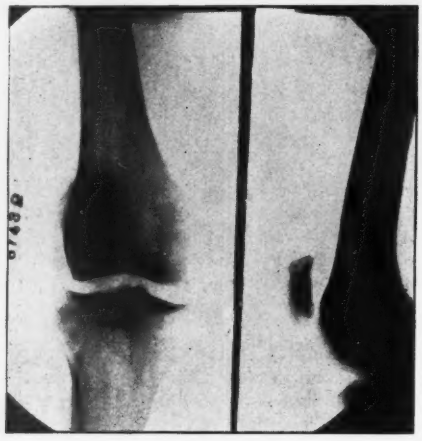

Fig. 11
Miss J. McD.: Linear fracture patella.

Case 3.—Mr. M. had a fracture dislocation of the external semi-lunar cartilage.

After an injury to the knee six months before he came under our observation the patient had been told that he had a sprained knee.

Examination revealed a hard prominence on the outer side of the knee just above the head of the tibia. This hard prominence was painful when palpated. When he flexed his knee it was difficult to tell whether the prominence was attached to or sprung from the external condyle of the femur or the outer side of the tibia. X-ray did not reveal evidence of bone damage.

At operation we found a fracture-dislocation of the external semi-lunar cartilage. This was removed and the patient now has a perfect functioning knee.

INJURIES OF THE ANKLE

Injuries about the ankle are of particular interest as we find that that is the location where most men make a diagnosis of sprain, apparently with the least amount of hesitation.

Case 1.—Miss McL. had a fracture of the scaphoid.

The patient, a trained nurse, stepped from a street car, walked to her room and the next morning reported that she had sprained her ankle.

Examination revealed no swelling of the foot, but she had pain when she walked. There was localization of pain over the scaphoid. The picture revealed a fracture of the scaphoid.

Case 2.—Mrs. Z. suffered a fracture of the internal malleolus.

Fig. 12
Mrs. Z.: Fracture of internal malleolus.

Following an injury to the ankle, she was treated for a sprain. When she came under observation there was a great deal of swelling about the ankle, pain over the internal malleolus, and limitation of weight-bearing.

X-ray showed a fracture of the internal malleolus.

Case 3.—Miss S. M. E. had a fracture of the external malleolus.

The injury resulted from turning the ankle, she thought. She came under observation immediately afterwards.

Examination revealed pain and swelling. Pain was localized over the tip of the external malleolus.

An x-ray was requested, and it revealed a fracture of the external malleolus.

Case 4.—Mrs. H. had a fracture of the second and third metatarsal.

After injury to the foot, she was treated in an institution where she was told that she had a sprained ankle and that all that was necessary to do was to soak the foot in hot and cold water. This she did for one month. During that time she complained of great pain in the foot, particularly upon weight bearing.

When she came under observation the foot was greatly swollen. There was no alteration in the relationship of the bony landmarks about the ankle. There was pain, however, over the second, third and fourth metatarsal.

X-ray revealed a fracture of the second and third metatarsals.

Under treatment the pain has disappeared. The swelling has entirely gone, and the patient now is able to bear weight without any discomfort.

Case 58174.—There was a fracture of the external cuneiform and second metatarsal.

This case is introduced to illustrate how easily a sprain fracture may be overlooked. An incomplete fracture of the external cuneiform and an incomplete fracture of the second metatarsal exists. Unless cases of this kind are x-rayed after careful examination the fracture will, most certainly, be overlooked.

CONCLUSIONS

I believe that enough has been presented to prove my point that the use of the terms "Sprains and Contusions" should be reserved for those cases in which definite injury of bony structure can be proven not to exist.

1522 Aline Street.

THROMBO-ANGIITIS OBLITERANS

REPORT OF ACUTE CASE IN CHILD OF TWO YEARS*

By James A. Cahill, Jr., M.D.,
Washington, D. C.

Much confusion has occurred in the literature, as well as in the minds of many physicians, on the subject of thrombo-angiitis obliterans, because of the many titles and ideas regarding this condition. My purpose in writing this paper is, first, to consider the subject in its entirety and to emphasize a few important theoretical and clinical points. Another object is to report a case and phase of the condition, about which little is seen in the literature. I mean the acute stage of this disease.

The disease, thrombo-angiitis obliterans, has many synonyms; Jiddaische Krankheit, Buerger's disease, endarteritis obliterans, and intermittent claudication are among the most common terms applied to it. Thrombo-angiitis appears to be the most appropriate title.

An interesting article concerning the etiology and pathology of this condition is found in the *Boston Medical and Surgical Journal* of March 29, 1923, in a report by Dr. Howard C. Bean.[1]

Thrombo-angiitis obliterans is a disease of unknown origin, of the blood vessels, or blood, characterized by obliteration of the vessels of the extremities, followed by certain trophic and vasomotor disturbances. It is a comparatively rare disease, but a great deal is being written upon the subject at present. It was first fully described by Leo Buerger, of New York, who believed it to be of infectious origin and of unknown cause. Almost all of his cases occurred in young men between the ages of twenty-five and forty, of Hebrew descent, who were, as a general rule, heavy cigarette smokers. Willy Meyer believes that the smoke present from cigarettes affecting a previously weakened nervous system may be largely to blame. Heredity probably plays no part, although many cases have been reported in the same family. There is no apparent connection between the disease and diet. It is said to occur only in males, and not in females, and perhaps the endocrine glands play an important role.

There are no known infectious diseases that are precursors of thrombo-angiitis, although typhoid fever has been blamed. However, David Perla[2] states in reporting forty-one cases of thrombo-angiitis obliterans that tobacco, typhus fever, or other previous infection play no part in the etiology. His review of the forty-one cases was a complete study of the etiology and pathology and diagnosis of this disease. The pathology, as described by Buerger, is an occlusive thrombosis of vessels with inflammatory reaction of the vessels, and with the end result of ulceration and gangrene. The veins, either superficial or deep, or both, are involved in 40 per cent of the cases, and Buerger[3] finds that it is a thrombotic process in the arteries and veins of the extremities, usually in the larger vessels, starting distally and working up. The thrombus is a red or mixed clot with giant cells, leucocytes and disintegrated cells. The process is preceded and affected probably by acute inflammatory changes followed by organization and canalization of the thrombus. Surrounding the vessel are usually thrombotic tissues that bind down the artery, accompanying vein and nerves. The laboratory findings show the blood to be practically normal, though Bernhard[4] has shown a definite hyperglycemia, and there is a moderate leucocytosis, as pointed out by Thomas. Basal metabolism is normal. The bone shows no changes until attacked by gangrene or osteomyelitis, which usually occurs late in the disease.

SYMPTOMS

The symptoms in the chronic form, which is by far the more common type, at first are rather vague, and are often diagnosed as rheumatism, frostbite, weak foot, and so forth. Among the

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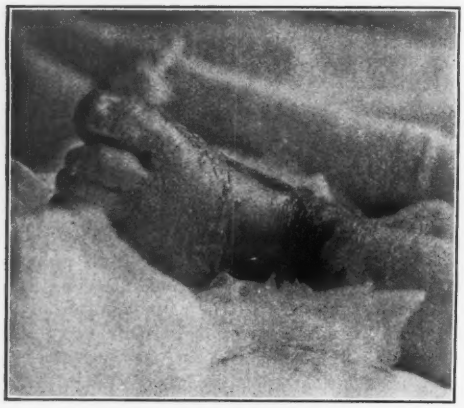
*Read before the Medical Society of Virginia, Maryland and District of Columbia, June 8, 1927.



Acute thrombosis, showing gangrene of foot and leg.

first symptoms are pain in the extremities, coldness, tingling and cyanosis. As the disease progresses the pains usually increase in severity and may become excruciating, or may take the form of intermittent claudication. The extremity itself usually presents a congested appearance, rubor in the dependent position, or a waxy, livid hue when elevated. There is either an absence of pulse or a very faint one. Ulcers may form which are very obstinate and difficult to heal. These ulcers eventually develop into gangrene, which may cover a wide and rapidly spreading area, or may be simply confined to a small portion. This condition usually attacks the lower extremities, and very rarely the upper. The important symptoms, therefore, and the ones to be looked for are pain, intermittent claudication, scattered phlebitis, rubor or blanching of foot, disappearance of pulse, ulceration and gangrene.

The chief complication of this disease is gangrene. There may also be pyemia, which usually means a fatal outcome. The diagnosis is made from the clinical picture. Therefore, the emphasis by Buerger rests upon the following: (1) the racial and sex predilection; (2) the early involvement of the lower extremities; (3) the early symptoms of pain or intermittent claudication; (4) the evidence of pulseless vessels; (5) migrating phlebitis; (6) the existence of rubor in the dependent position; (7) the slow progressive chronic course terminating in gangrene. This, of course, is the chronic or slow form of the disease.

DIFFERENTIAL DIAGNOSIS

The diseases that may be confused with thrombo-angiitis obliterans are syphilis, tuberculosis, diabetes, arteriosclerosis, and Raynaud's disease. This latter condition is one of unknown etiology. There is a similar blushing and blanching of the foot. However, the pain in this condition has a distinct nerve distribution and is seen in symmetrical parts. The conditions are very similar. Thrombo-angiitis obliterans runs usually a chronic course, but also has an acute phase which will be described shortly. Raynaud's disease always shows atrophy of the phalanges; gangrene comes about slowly; diabetes and senile gangrene are usually easily differentiated by the laboratory and physiological findings.

Let us now turn to the acute phase of this disease, which will be illustrated by an interesting case report. The acute stage shows all the signs manifest of an acute inflammatory invasion of the deep arteries. There is sharp lancinating pain in the legs, marked presence of ischemia, disappearing pulse, all symptoms referable to the invasion of the deep circulation, red purplish discoloration of the part, sometimes edema, blebs and blisters. In this condition there is usually moderate fever, rapid pulse, and severe prostration. There is a general reaction.

TREATMENT

The treatment I will speak little of. It may be either medical, surgical, or a combination of both. Emphasis should be laid on the conservative treatment first in the chronic condition which entails the early recognition of the disease. Steele,[5] of Philadelphia, uses large doses of 2 per cent sodium citrate intravenously with hot air baking and potassium iodide. Willy Meyer recommends the use of Ringer's solution by hypodermoclysis. After gangrene has set in, it is best to wait and use the sodium citrate solution and apply external heat until there is a definite demarcation. High amputation should not be resorted to unless all other measures fail and the patient is in danger of life. For pain, of course, opiates and anodynes will be required.

Peri-arterial sympathectomy is recommended by LeRiche, whose operation bears his name. This operation has given relief from pain in this condition, and especially in Raynaud's disease, and has made the patient quite comfortable, and the originator reports striking results. Not all have been able to get the results of LeRiche, although generally pain is relieved, which is an important factor. However, the disease usually progresses, gangrene finally sets in, and amputation is required.

Gangrene of foot due to the acute thrombosis.

Thrombo-angiitis obliterans is both acute and chronic. By far the most common type is the chronic form, and it is the one on which I have laid particular emphasis, as it is in this form that most of our cases will present themselves. However, occasionally the acute phase will be manifest, which will be largely characterized by an acute embolic condition, obliteration of the vessels with accompanying inflammation below the site of the thrombus and a definite gangrene which at first suggests a rapid spreading and fulminating form; but if it is allowed to subside and medical treatment instituted, a definite line of demarcation will be shown and the gangrenous area can then be amputated. I wish to report a very interesting case which illustrates the acute phase of this disease. In looking over the literature, I have been unable to find much on the acute cases, and no case report of thrombo-angiitis in a very young patient. My case occurred in a child two years of age who was of Jewish parents, which fact, as you see, was important in the history.

The child was sent to Providence Hospital on October 15, 1924, with the following history: He had been in fairly good health until about four months previously—that is, until about the age of twenty months—when he was treated for a large furuncle of the neck. The glands of the neck became very much swollen, and the surgeon who saw him at that time believed it was due to a tonsil infection and advised removal of the tonsils. The child gradually improved from these boils, but would not eat anything, and seemed sickly and would not walk. On the night of October 14 he was put to bed. On the previous day he had worn black stockings for the first time, and upon awakening on the morning of October 15 he screamed with pain, was very fretful, and the mother, upon examining the legs, found blackish spots and gangrenous areas over the dorsum of the heel and toes of the left foot, and also on the second, third and fourth toes of the right foot. This was a symmetrical condition. Both feet were red, somewhat swollen and very painful to pressure, and the child was extremely fretful and apparently suffering excruciating pain. The temperature was 102°, pulse was rapid, respirations were 30. He was sent to Providence Hospital and was seen there by Drs. O'Donnell and Foote. It was believed at first that he had a gangrenous dermatitis, and Dr. Eichenlaub was called in consultation.

The physical examination generally was as follows: head and neck were normal except for a few scars in the neck, the result of the boils. Heart and lungs were apparently normal. The abdomen was negative. The left foot showed a gangrenous area involving the entire heel and lower third of the leg. The skin was black with around it a red inflammatory area. It appeared at first as if only the skin and not the deeper structures were involved. A similar condition was present on the second, third and fourth toes of the right foot. Laboratory findings showed the blood with hemoglobin, 30 per cent; coagulation time, 2½ minutes; red blood cells, 3,000,000; white blood cells, 14,000; differential count, small lymphocytes 20, large lymphocytes 5, large mononuclears 3, polymorphonuclears 68. Blood sugar was 90 mgs. per 100 c.c. of blood. The Wassermann reaction was negative. The urine showed a trace of albumin, no sugar and no casts. Examination of feces was negative for blood and parasites. A spectroscopic examination of the blood was negative for any change in the hemoglobin due to poisons. This patient was seen by Drs. White, Eichenlaub, O'Donnell, Foote and others on the Providence Hospital staff. Owing to the extreme condition of the patient and to the fact that no definite line of demarcation showed in the gangrene, he was kept under observation and placed under medical care. Two blood transfusions were given, and the coagulation time increased to four minutes. It would have been interesting to know the coagulation time before transfusion, but unfortunately we did not get this. The limbs were wrapped in cotton, elevated, and dry heat in the form of a baker kept on them.

Upon entry into the hospital the baby was markedly anemic, as was shown by the blood examination, but after transfusion and stimulation he gradually responded and improved considerably. A definite line of demarcation formed on the left leg at the junction of the middle and lower third. All of the tissues below this point were definitely gangrenous and required amputation. The second, third, fourth and fifth toes on the right foot were gangrenous at the middle and distal phalanges.

On November 10, 1924, he was taken to the operating room and under ethylene anesthesia the amputations were done, namely: the amputation of the left leg at the middle and lower third, and also amputation of the distal phalanges of the second, third, fourth and fifth toes of the right foot.

This case was believed worthy of report and consideration because it showed the acute stage of a now widely known and much discussed condition. It occurred in an infant suddenly, and

was evidently of embolic origin. However, after the amputated parts were removed, they were sent to the laboratory and were examined by Dr. Neuman, who dissected the vessels and found a clot filling the blood vessel and evidence of arteritis. The probable cause of the condition was embolism, brought about by the dislodgement of the blood clot and localization of the thrombus in the deep vessels of the leg. The anemia was probably the predisposing factor in this case. I believed it to be a case of thrombo-angiitis obliterans, bilateral in type, and occurring with a definite acute onset.

DIFFERENTIAL DIAGNOSIS

Now in considering the diagnosis in this case we must include (1) Raynaud's disease, syphilis, scleroderma, and sclerodactyly. Let us first dismiss syphilis because the Wassermann reaction was negative, and there was an absence of any other luetic signs. Scleroderma and sclerodactyly may also be excluded because they are of chronic duration and not acute, and they are progressive. There is no pain, as was present in this case; no sensory disturbance, as was evident in this case, and affection is seen most commonly in the hands. Local asphyxia and local syncopy, according to Buerger, dominate the clinical picture for a long period in advance of the sclerodermic condition. There is always atrophy of the phalanges following the first stage of hard edema. In these cases there are not the acute inflammatory signs or reaction that were present in this child. This, therefore, narrows us down to the consideration of either Raynaud's disease or thrombo-angiitis obliterans.

In thrombo-angiitis obliterans the vessels are permanently closed; in Raynaud's disease the closure is only temporary. The course of the disease is progressive in thrombo-angiitis and not in Raynaud's disease. Raynaud's disease is usually symmetrical and it involves often the nose and ears. Thrombo-angiitis is usually confined to one extremity. Our case was bilateral and symmetrical. However, I believe that it was not Raynaud's disease. Migrating phlebitis is common in thrombo-angiitis. Raynaud's disease occurs in men and women; thrombo-angiitis is found only in men. Raynaud's disease is found in the very young; also thrombo-angiitis can occur in the young, but is rare. It is not without difficulty that we reach the conclusion that the diagnosis is thrombo-angiitis obliterans of the acute type. It is this condition because other evidence is against Raynaud's disease, namely: the fact that the child is a male of the Jewish race, that the condition came on acutely, that there was marked pain, and that there were definite acute inflammatory changes in the artery with the lodgment of the thrombus. Gangrene was the sequel. These conditions occurred in the child, who was enemic and the type of individual susceptible to thrombo-angiitis. We, therefore, can say that it can occur in the young and that it can be bilateral or symmetrical.

SUMMARY

In conclusion we believe (1) that thrombo-angiitis obliterans is a circulatory disturbance characterized by a gradual obliteration of the arteries and veins of the extremities, more especially of the legs; (2) that it can also occur acutely with almost an immediate obliteration of the arteries and veins: (3) that the cause of the disease is not clearly known, but that certain chemical substances in tobacco smoke on a previously unstable nervous system may predispose, also anemia, as in this case, may predispose; (4) that the disease occurs entirely in males, and most frequently in the Jewish race; (5) that there are two definite types, acute and chronic; (6) that the sequel is gangrene, which usually occurs in from two to five years in the chronic form, and suddenly in the acute form; (7) that thrombo-angiitis can be bilateral, as in Raynaud's disease; (8) and that it can occur in a child, as can Raynaud's disease or scleroderma.

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SUBACUTE INGUINAL LYMPHOGRANULOMATOSIS*

REPORT OF TWENTY-SEVEN CASES

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In the past thirty-five years numerous reports have been published of a subacute inguinal adenitis of unknown etiology under the term of "climatic bubo." The name "climatic bubo" is entirely inappropriate, as there is no evidence that climate or climatic conditions bear any causal relation to the condition.

In more recent years, however, numerous reports of the condition have been made by Can-

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tieri,[2] Arillega,[3] Ravant,[4] Destefano,[5] Vaccarezza,[6] Dufour and Farrier,[7] and Kristjansen,[8] under the more appropriate name of subacute inguinal lymphogranulomatosis.

The etiology of subacute inguinal lymphogranulomatosis is unknown. Various causative agents have been reported to have been isolated from the excised glands, or from the aspirated necrotic centers of enlarged glands. The specific agent has not been found. The condition is apparently a clinical entity. The disease affects young adults. In this series of twenty-seven cases the average age was 27.2 years. The oldest was 39 and the youngest was 21. F. Arrillaga[3] reports the condition in both men and women, and the ages of his cases varied from 17 to 45 years. The late Sir Patrick Manson was of the opinion that climatic bubo was most probably due to some virus which was introduced through a wound which had been overlooked, or perhaps an insect bite on the legs or genitalia. Dr. Aldo Castellani in his "Manual of Tropical Medicine" states that the etiology is still obscure and that it is a disease *per se*.

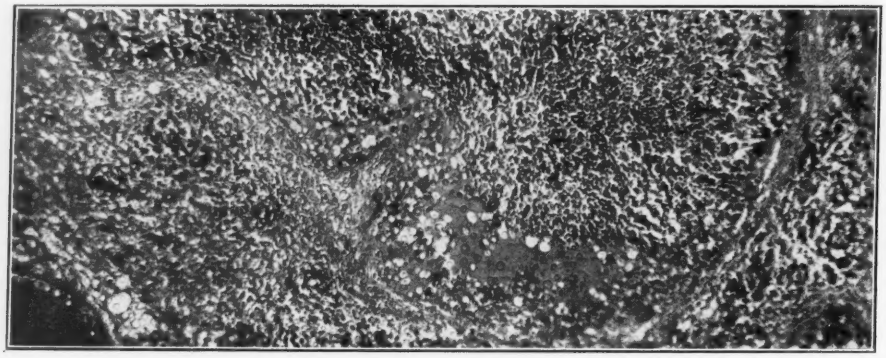
There has been some evidence to support the view that the disease is contracted by sexual intercourse. In Roth's report of seventeen cases many years ago, all had exposed themselves to colored prostitutes. While some of the cases reported in this article admitted sexual intercourse with colored prostitutes of the West Indies, or Central and South American countries. others were very emphatic in their denial that they had had intercourse with any colored woman. Those who admitted intercourse denied that there were any signs of abrasion, irritation. or urethral discharge, or any lesion about the genitalia following exposure. The Wassermann test in all the cases was found negative. Home,[9] in discussing the prevalence of climatic bubo in the British Navy, states:

"The disease is generally thought to be venereal, even by patients contesting the assignment. The true nature of these cases remains unknown."

The condition is found in temperate as well as semi-tropical and tropical countries, but it is more frequently seen in the United States in those who have recently returned from the West Indies, Central or South America. Of these cases only one had not been out of New York for several months; one had recently returned from India; two had recently returned from ports of the Southern states; four had arrived from South America, and the remainder, or 70 per cent, had recently returned from the West Indies, Central America, or from ports in both.

The glands involved are the superficial subinguinal group. This would indicate that if there was some type of primary lesion it would have been on the lower extremities, penis, scrotum, buttocks, anal canal, perineum, pubic region, or the lower part of the abdominal wall. The lymphatics of the rectum follow closely the vascular arrangement, which in turn follow the embryological division of tissues. The anal canal developing from the proctoderm has a lymphatic system which drains downward from the muco-cutaneous line through the perineum into the superficial subinguinal group of glands. Therefore, one would expect to find a primary lesion, if present in this region, in the anus, and not in the rectum. Such a lesion was not found. There was no evidence of recent or past infection about the anus or rectum.

One would not expect to find a primary lesion in the bladder, the prostate, the seminal vesicles, or even the posterior urethra, as the lymphatic vessels of these anatomical parts lead to the hypogastric lymph glands. Likewise, the testicle, epididymis and tissues of the cord drain upward along the spermatic vessels, anastomosing with those of the bladder and prostate and leading into the hypogastric nodes and to those along the vena cava and aorta. While infections of these parts might secondarily infect the anterior urethra, and as a result an involvement of the subinguinal glands might occur, some evidence of the primary infection would probably be noticed by the patient, or at least be found on examination. Notwithstanding the lymphatic drainage of the testicles, epididymis, seminal vesicles, prostate and bladder, they were all examined for evidences of recent or present infection, and in all cases were found negative. The urine was negative in all cases. When one considers the lymphatic drainage to this group of glands, if some primary foci were present about the genitalia, the most superficial examination should locate it. There was no evidence of a urethral discharge, fissures, infected hemorrhoids, ulcerations, or abrasions. There were no abrasions or recent scars about the thighs, legs, feet or toes of the patients with subacute inguinal lymphogranulomatosis. There was no evidence of insect bites about the pubic region, or the lower abdomen, and those questioned denied having even been intimately connected with pediculi. Eleven of this series (40 per cent) showed infection in the mouth and throat; pyorrhea, carious or abscessed teeth, or enlarged



Section showing proliferation of lymphocytes and many plasma cells. Lymph sinuses dilated and hemorrhagic area present in area of necrosis.

reddened tonsils. There was no evidence of cervical involvement beyond the fact that in some the cervical glands were scarcely palpable.

A number (30 per cent) first noticed the tenderness and enlargement of the glands when exerting themselves. A similar history has been reported in almost all series of cases reported, and for this reason they have been designated "fatigue glands." This would seem to be only a casual factor and not of any etiological importance.

The fact that 19 per cent showed bilateral enlargement suggests that the primary lesion, if present, was in the midline; that is, about the anus, urethra, or perineum, although no macroscopic evidence can be found to support this.

The pathology of subacute inguinal lymphogranulomatosis in the very early stages is not unlike that of a subacute condition resulting from any low grade pyogenic infection. As the acute process becomes more pronounced, a periadenitis becomes more obvious and the individual glands becomes edematous and the whole group of subinguinal glands becomes more or less fused into a single inflammatory mass. On cutting through such a mass the capsule is found to be greatly thickened, and the centers are more or less necrotic. In advanced cases the entire center is one softened jelly-like mass surrounded by the thickened capsule. As a rule, purulent material is not present, but the center is composed of this softened necrotic gland tissue.

On microscopic examination of glands from early cases, there is found evidence of an acute inflammation, characterized by edema and hyperplasia of the lymphoid tissue. The lymph sinuses are dilated, the blood vessels are engorged, or perhaps small hemorrhagic areas are seen about the small foci of necrosis throughout the gland. There is a proliferation of lymphocytes and many typical plasma cells are seen throughout. As the condition advances, there is seen quite an appreciable thickening of the fibrous capsule. It appears edematous and the blood vessels are congested. There is also a thickening of the fibrous septa. As the condition progresses, the entire center becomes necrotic and hemorrhagic areas are quite in evidence about the periphery of the gland.

SYMPTOMATOLOGY

The period of incubation, if in any way connected with sexual intercourse, must be relatively long. Rost, in his cases which he attributed to sexual intercourse, states that the period between exposure and the onset of symptoms was five weeks. Destefano and Vaccarezza in a series of cases determined the incubation period to be between ten and twenty-five days. If it were a disease of sexual intercourse, and if one could rely upon the history of exposure, it would seem that four or five weeks more nearly approaches the correct figure.

The onset is insidious. There is first noticed slight tenderness in the slightly enlarged subinguinal group of glands. After a time varying from a few days to a few weeks, there is vague malaise and usually slight fever. The average time between onset of tender glands and the time in which they felt they needed medical attention in this series of cases was 20.3 days. There is as a rule very little discomfort unless the glands are pressed directly upon, and the usual history is that they continued working two or three weeks after the onset, but as the

condition progresses and the mass enlarges and becomes somewhat painful the patient decides to present himself for treatment. The pain is seldom sufficient to keep the patient awake at night, even after signs of acute inflammation are evident.

In the early stages the overlying skin is normal in appearance, and the individual glands are easily palpated. But with increase in size of the glands the periadenitis gradually involves the skin. The skin then becomes firmly attached and soon becomes reddened. The mass of glands by this time has usually reached the size of an egg. In no case was there any evidence of a lymphangitis. There are no intra-abdominal symptoms except in those cases in which secondary involvement of more proximal glands occurs, in which case slight tenderness on deep pressure in the lower quadrant of the affected side may be elicited. Besides the localized pain and tenderness there are no other symptoms of note characteristic of the condition. The fever varies with the degree of necrosis. Before central necrosis occurs the temperature is usually normal or subnormal. As involvement progresses there is a gradual rise in the temperature curve until the daily rise may be 100 to 101°. The appetite and general well being are correspondingly affected with the rise of temperature. The patient usually states that he feels well. He appears but slightly ill, even when his temperature is running around 101°.

The condition is usually unilateral. In this series of cases 10 per cent were bilateral, 15 per cent were on the right side and 66 per cent were on the left side. Of this series of cases, one was a colored man, one a Porto Rican, one a Philippino, and the remainder were white men born in the United States or Europe.

There is no definite blood picture associated with the disease. The leucocyte count is usually within normal limits before central necrosis occurs. With the onset of necrosis and rise of fever there is a corresponding rise in the white cell count. By the time the patient is sufficiently ill to seek hospital attention, the leucocyte count is usually a little above 10,000. In this series of cases, including those in which necrosis of the glands had occurred, the average leucocyte count was found to be 12,700. The differential count showed an average of 70.1 per cent polymorphonuclear leucocytes. There is usually a slight secondary anemia. The average red cell count was 4,300,000 and the average hemoglobin was 83.3 per cent.

While there is no absolute proof that the condition is contributed through intercourse, the majority of those who have studied it are of the opinion that it probably is contracted by this method, notwithstanding the absence of any primary lesion or evidence of irritation. It is, however, not a disease contracted from colored prostitutes, if the history of intercourse given is correct. The majority who admitted previous intercourse denied intercourse with any except white women.

The diagnosis of subacute inguinal lymphogranulomatosis is made by the history of gradual onset of enlarging inguinal glands without any evidence of a primary lesion or associated or contributary lymphangitis; by the denial of any venereal disease in recent months; or ulcer, anal fissure or infected hemorrhoids or any other contributory lesion about that part of the anatomy whose lymphatics drain into the subinguinal group of glands. The great majority will give a history of a recent visit to the West Indies, Central or South America. The cultures from aspirated glands will be found sterile. Smears will show no organisms. Those who admit venereal disease at some time during their life will assert that they have apparently been cured for months or years before the onset of the adenitis.

Ravaun and Schukenitch[4] found nothing in their cases to suggest syphilis, tuberculosis or plague. In fact, none of those who have studied the condition has felt that it was in any way connected with syphilis, although the opinion of most is that it is contracted by intercourse. The bubo of syphilis does not usually cause such a condition, or if it did one would expect to find the Wassermann positive in at least a large per cent of the cases. The bubo of gonorrhea is relatively rare, but when it does occur it is much more acute, and does not tend to develop into a chronic condition. The bubo of soft chancre appears during the time of the acute stage of the chancroid, and the bacillus of Ducrey can usually be isolated from the suppurating gland. The course of the tuberculous glandular involvement may be very similar as to onset and chronic course, but the section of the excised gland gives an entirely different picture. Hodgkin's disease and other malignant conditions can be differentiated only by excision and microscopic examination of the involved glands; although the clinical picture is usually such that the differential diagnosis gives little difficulty. While the microscopic sections of the glands may resemble those

Case.	Age.	Recently returned foreign country.	Previous venereal disease.	Side affected.	Duration before admiss'n.	Temperature on admission.	Operation	Temp'ture after operation.
1.	22	West Indies.	Denied.	Right.	26 days	99.8	Excision	100.6 Nor five days
2.	24	Gulf Ports.	Denied.	Right.	26 days	101.0	Excision	103.6 Nor five days
3.	39	Haiti.	G. C. (8 years ago)	Left	5 days	100.6	Excision	101.2 Nor ten days
4.	26	West Indies.	Denied.	Left.	11 days	101.4	Excision	103.6 Nor 8th day
5.	30	India.	Denied.	Left.	30 days	99.0	Excision	99.6 Nor three days
6.	38	South America.	G. C. 1918.	Bilateral.	4 days	100.2	Excision	102.0 Nor six days
7.	30	Gulf Ports.	G. C. 1915.	Left	14 days	99.6	Incision	99.6 Nor nine days
8.	30	Gulf Ports.	Chancre 1915. Denied.	Right.	20 days	99.2	Incision	99.6 Nor three days
9.	32	Mexico.	Chancre 1918.	Left.	7 days	101.2	Excision	101.0 Nor three days
10.	27	Central America.	G. C. 1919.	Right.	11 days	99.4	Incision	100.0 Nor five days
11.	22	South America.	G. C. 1924.	Left.	14 days	101.0	Excision	102.2 Nor three days
12.	24	Mexico.	Denied.	Left	13 days	99.6	Excision	101.2 Nor seven days
13.	25	West Indies.	Denied.	Left.	16 days	102.2	Incision	102.6 Nor five days
14.	26	West Indies.	G. C. 1925.	Left.	14 days	100.0	Excision	103.0 Nor ten days
15.	28	Gulf Ports.	G. C. 1924.	Bilateral.	64 days	99.2	Excision	100.2 Nor four days
16.	23	Cuba.	Denied.	Bilateral.	4 days	98.4	None	0.
17.	21	Venezuela.	Denied.	Left	30 days	100.0	Excision	103.0 Nor five days
18.	25	Cuba.	Denied.	Bilateral.	30 days	100.6	Incision	Nor third day
19.	26	Central America.	Chancre. Gonorrhea.	Bilateral.	17 days	98.4	Excision	104.6 Nor third day
20.	31	South America.	Denied.	Right.	26 days	100.2	Excision	103.0 Nor four days
21.	27	Mexico.	Denied.	Right.	6 days	98.4	Excision	102.2 Nor seven days
22.	32	Mexico.	Denied.	Left.	21 days	100.0	Excision	102.0 Nor four days
23.	25	Mexico and Cuba.	Denied.	Left.	7 days	99.0	Excision	102.0 Nor four days
24.	27	Porto Rico, S. A.	G. C.	Left.	50 days	99.4	Excision	100.4 Nor five days
25.	25	Not Any.	Denied.	Right.	14 days	99.4	Incision	Normal two days
26.	25	Mexico.	Denied.	Left.	15 days	100.6	Excision	103.6 Nor six days
27.	32	Panama.	G. C. (7 years ago)	Left.	21 days	100.6	Excision	100.2 Nor six days

seen in tularemia, the clinical course of the disease is quite different.

The treatment in the early cases is symptomatic. The patient should be placed in bed. The local treatment, while apparently seeming to alter the course little in the great majority of cases, may make the patient more comfortable. Various local remedies have been recommended such as lead lotion, ichthyol ointment, tincture of iodine, the ice bag and hot water bottle; while others recommend the mercury quartz lamp, or inject mercury salts, or inject locally iodoform emulsion, or some similar emulsions. All these methods apparently alter the condition little or not at all, unless they do somewhat hasten necrosis of the glands and produce redness of the overlying skin. Potassium iodide by mouth and arsphenamin intravenously have no effect.

Destefano and Vaccarezza have recently reported excellent results in a series of seventy-two cases with injections of antimony and potassium tartrate. The injections were given twice weekly and they reported improvement soon followed. Low and Cooke[10] more recently have brought forward the protein shock treatment together with aspiration of the softened gland centers. The vaccine of typhoid, paratyphoid A and B, was given in increasing amounts at intervals of four to eight days, depending upon the reaction. Dufour and Ferrier[7] reported good results in one case which was treated with iodine and injections of emetin.

While many cases may recover without surgical treatment, the majority of those who report for hospital treatment usually progress until incision or excision of the affected glands is the only method of choice. While surgical procedures do not in all cases give good results,

they do in the great majority lessen the disability of the patient appreciably, which is at least of some economic importance. In this series of cases one patient recovered without operation. Recovery, however, was not attributed to any particular method of treatment. In twenty cases the glands were resected. In some of those resected, previous incision and drainage had been done, either before entering the hospital, or at the hospital, but the condition was not improved, and excision was eventually the only choice. Six recovered after incision and drainage of the enlarged glands.

The period of disability, however, was found to be lower in those cases in which excision was done than in those who recovered following incision. The average disability of those in whom the entire mass of glands were resected was 27.1 days, while after incision, the average period of disability was 35.2 days. While excision in the majority from an economic viewpoint seems the method of choice, some get quite a severe reaction and occasionally involvement of the deeper more proximal group of glands following, with slow recovery. This, however, may occur following incision. In this series five showed some involvement of the proximal deeper glands; three after excision and two after incision. This is characterized by continued rise of fever with tenderness on deep pressure in the lower abdomen. Post-operatively there is always a rise of the temperature curve to usually about two degrees above the highest pre-operative temperature, which declines to normal in five to nine days.

While excision of all the involved glands is not an ideal treatment, it is for the majority the only successful treatment at the present time, and gives more rapid recovery than incision.

SUMMARY

Subacute inguinal lymphogranulomatosis is of relatively frequent occurrence in the coast cities of the United States. The etiology is unknown, but it is probably contracted through sexual intercourse, although no primary lesion or portal of entry can be demonstrated. While a certain per cent clear up without medical treatment, a certain large per cent progress until incision or excision of the affected glands is the only method of treatment. Of this series of cases the average age was 27.2 years. The oldest was 39 and the youngest 21. Fifty-two per cent denied ever having had a venereal disease. The Wassermanns were negative in all. There was no evidence or history of recent urethral discharge or irritation. Nineteen per cent showed bilateral involvement, 15 per cent involvement of the right side only, and 66 per cent showed involvement of the left side only. In 39 per cent there was evidence of other pathological conditions such as infected teeth or tonsils. Thirty-nine per cent first noticed the swelling and tenderness when doing some unusual exertion. This has given rise to the term "fatigue glands," which is of no direct etiological importance. The average duration of the condition before seeking medical attention in this series of cases was 20.3 days. The duration of hospital treatment depends upon the method of treatment.

Of this series part were examined for malarial parasites, amoebae, filariae, Widal tests were made; blood cultures were made. In all cases the results were negative. Smears and cultures from aspirated, incised or excised gland tissue were negative. A search was made for Leishman-Donovan bodies, but none was found. The urine was negative in all cases. The average leucocyte count was 12,700 with 71.1 per cent polymorphonuclears. The average red cell count was 4,300,000 and the hemoglobin 83.3 per cent. A small per cent will recover without surgical treatment. However, excision of the affected glands, while a more formidable procedure, offers the better results from an economic viewpoint. Early resection of the involved glands, instead of so-called expectant treatment, will materially lessen the period of disability in the great majority of cases, and is the method of choice in treating this condition.

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TUBERCULOSIS IN MEDICAL CURRICULA*

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This subject is presented with a full consciousness of the fact that the deans of medical schools are being overwhelmed with the rapidly increasing knowledge of medicine, much of which should be transmitted to the student through well recognized channels, but a great portion of which is sponsored by various specialties with representatives clamoring for recognition and a place on the curriculum. Consequently, if the deans are at all conscientious they are heavily burdened with the responsibility of discrimination. They must choose that which is most essential and leave on the shelf much for the future consideration of those who become specialists and the more studious among those who become general practitioners. In some schools junior and senior students are now required to take examinations in eighteen to twenty subjects, being urged by teachers to consider each subject of great importance.

It is not my desire to criticise present conditions or to suggest impossible or antagonistic methods of procedure. However, I believe we can truthfully say that the facilities for teaching tuberculosis in medical schools have not kept pace with the increasing knowledge of the disease and the improved methods of teaching. This is not wholly due to lack of interest or the absence of effort on the part of medical school authorities and teachers of clinical medicine, but it is rather to be explained by many inhibitory influences acting directly or indirectly. The diagnosis and treatment of this disease have never been adequately taught. In the past this may have been due in part to fear of tuberculosis, but no doubt chiefly to the fact that hospital beds have not been available for long continued cases.

Almost coincident with the movement to standardize medical schools and to improve the methods of teaching with a more equable distribution of time allotted to various subjects, we were beginning to develop our present methods and machinery for the diagnosis, prevention and treatment of tuberculosis. In this country, the National Tuberculosis Association was organized with affiliated state, county and city organizations. Under the stimulus of Koch's discovery of the tubercle bacillus and the recognition of its prevalence in the human organism through the diagnostic use of tuberculin, great enthusiasm was manifested. Quite properly, the sociological phase of the problem was stressed and the interest of the lay people enlisted. The educational campaign was launched with the expenditure of enormous sums of money. Dispensaries, tuberculosis hospitals, sanatoria and preventoria have been established throughout the land. Political expediency and prevailing opinions as to environment caused many of these institutions to be located in places considered inaccessible for teaching purposes. As a result much clinical material, which otherwise might have been available under our standardized methods of teaching, has been diverted to these out-of-the-way places where likewise many physicians, well qualified by training and experience to teach tuberculosis, are forced to keep their light under a bushel.

The long standing but poorly founded belief in the climatic treatment of tuberculosis has resulted in the establishment of many resorts far removed from medical centers. The resulting migration has rendered inaccessible much additional clinical material and medical skill. As evidence of this, at least two of these resorts have established graduate schools of tuberculosis. Unfortunately circumstances have forced upon us a consecutive readjustment of our opinions and teachings as knowledge has increased. For example, less than a hundred years ago the disease was treated by vomiting, purging, bleeding and horseback riding. This was truly intensive therapy, calculated to shorten the course of the disease with a corresponding abbreviation of life. The absolute reversal of these methods has grown out of the successive contributions of such men as Laennec, Boddington, Brehmer, Dettweiler and Trudeau.

Tuberculosis specialists have often been too cocksure of their position. Yet as we view the zigzag course they have followed we find it pierced by the straight line of progress. Paid educators and lay workers without the guidance of scientific training have occasionally garbled established facts and often exhibited undue assurance in the presentation of unauthoritative knowledge. As a consequence the public has been shocked by alternating currents of dogmatism and doubt.

Tuberculosis specialists, public health nurses,

*Chairman's Address, Section on Medical Education, Southern Medical Association, Twenty-First Annual Meeting, Memphis, Tennessee, November 14-17, 1927.

lay workers and ex-patients have indulged too freely in criticism of the family physician, especially with reference to his alleged lack of knowledge concerning the diagnosis and treatment of the disease. This unfortunate attitude coupled with the ingrained belief in climate often results in a lack of confidence on the part of the patient and a precipitate march across state lines or scurrying into the hands of the tuberculosis specialist without the courtesy of council with the family physician. As a consequence the family physician is tempted to withhold the truth, knowing that in such cases his choice lies between two evils: he must either practice deception or run the risk of losing his patient. Early diagnosis and frank dealing are correspondingly discouraged. Out of all this has grown a breach between the organized forces fighting tuberculosis and many members of the medical profession. Even the prospective medical student is influenced more or less by the circumstances recited above. After he enters medical school and finds that tuberculosis is excluded from the hospitals where he must learn clinical medicine and that cases accidentally discovered in the wards are promptly discharged or turned over to outside agencies for proper disposal, it is easy for him to get the impression that he might as well leave the solution of all tuberculosis problems to tuberculosis specialists, public health agencies and social workers.

Sir James Kingston Fowler,[1] after commenting on the diagnostic inefficiency of English physicians with reference to tuberculosis, gives as the chief cause "the absence of pulmonary tuberculosis from the wards and out-patient departments of the general hospital." In Scotland the Departmental Committee, considering medical education,[2] made the following recommendations:

(1) "Medical students and practitioners should be afforded facilities to attend the practice at tuberculosis dispensaries, sanatoria and other institutions."

(2) "It is advisable that tuberculosis dispensaries should, where possible, be directly associated with schools of medicine."

As a result of this committee report, a chair was founded in the University of Edinburgh. Sir Robert Philip says:

"The foundation of the chair stereotypes the recognition by the University of the place tuberculosis occupies in the every day work of the medical practitioner and in the large field of preventive medicine. The subsequent resolution by the University that the class in tuberculosis should be included in the regulations among the classes qualifying for graduation has further consolidated the position."

Occasionally in this country we find a tuberculosis dispensary or a sanatorium affiliated with a medical school for teaching purposes. Rarely do we find adequate provision for tuberculous cases in the wards of teaching hospitals.

The recent rapid decline in the death rate from tuberculosis in the United States might seem to justify a continuation of our present imperfect methods of teaching tuberculosis, but we must remember that while tuberculosis is no longer the chief cause of death, it continues to be the most important of all diseases, and there are many outstanding reasons why it should have more consideration in the medical school curriculum today than ever before.

It is readily conceded that tuberculosis continues to carry its age-long appeal because of its widespread incidence, its high mortality, its infectious nature, its social and economic significance. But it now lays extra claims upon medical schools because of newly acquired knowledge of its various phases and recent advances in treatment worthy of a wider application and calculated to stimulate further progress through clinical and laboratory research. According to our statistical methods there are in the United States approximately ten cases of active tuberculosis for every practicing physician, a fair practice awaiting each medical student who learns to recognize and treat the disease. Under present methods of treatment more than 100,000 advanced cases, otherwise hopeless, are in need of artificial pneumothorax, and 30,000 in which artificial pneumothorax is impossible or ineffective on account of adhesions or other complications, should be collapsed by extrapleural thorocoplasty. Even though these should be handled by specialists in institutions for the treatment of tuberculosis, the discovery and distribution of the cases, and in many instances the after care, should be in the hands of the family physician.

No less significant is the fact that many children are suffering from clinical tuberculosis, though symptoms and signs may not be sufficiently evident to place them in statistical columns; that latent tuberculosis is common and the lives of many individuals, who are apparently well, are rendered more fragile by the presence of this disease. The responsibility of educating and safeguarding these rests upon the family physician.

The present status of the tuberculosis problem not only demands increased diagnostic skill on the part of the family physician in order that

case finding may proceed, but the special therapeutic measures now being successfully applied in many advanced cases call for fine discrimination in determining the relative condition of the two lungs, the character and comparative age of lesions, degree of activity, and so forth. They also call for increased knowledge of artificial pneumothorax in order that uncomplicated favorable pneumothorax cases may secure intelligent management and continuation of treatment in every community where reasonable medical skill is to be had. Furthermore, a sane determination of the relative merits of physical examination and radiology with reference to the lungs is demanded, setting forth the necessity of x-ray interpretation, in the light of clinical findings. The increasing popularity of the x-ray in the diagnosis of tuberculosis has robbed many a medical student of his natural inclination to study the disease at the bedside. In the words of Sir James Kingston Fowler:

"Queer things may happen when a clinician who has scrapped his stethoscope calls in a radiologist who has not been a pathologist."

The teaching of tuberculosis in medical schools can be rendered much more effective without materially increasing the strain upon the present curriculum. The immortal Sydenham

"laid down two fundamental propositions which have stood the test of time: 'All diseases should be described as objects of natural history and all treatment should consist in an effort to permit nature to do her own work.' "[3]

Of all known diseases, tuberculosis presents the ideal conditions for the application of these postulates. It is impossible to teach tuberculosis without teaching the broad principles of general medicine. The importance of history taking and the diagnostic value of symptoms are not so beautifully and uniformly exhibited in any other disease. All the known physical signs produced by pleuro-pulmonary pathology are made evident through the ravages of tuberculosis: its treatment is primarily designed to aid and supplement nature; its pathologic stigmata appear at practically every post-mortem examination. The protean character of the disease with its wide range in variety of manifestations causes it to enter the domain of every specialty, demanding definite diagnostic skill and therapeutic consideration from every one who enters the practice of medicine regardless of his field of operation.

In one year the Royal Infirmary of Edinburgh (a general hospital) admitted 650 cases with recognized tuberculous lesions. While the majority of these were admitted because of tuberculosis of the lungs, pleura and lymph nodes, the list shows that forty different organs and structures were involved and, in addition, there were twelve cases of generalized tuberculosis. Certainly no other disease furnishes such a wealth of material for clinical purposes.

The diagnosis of tuberculosis and the fundamental principles of treatment should be taught by the professor of medicine. Until he proves his capacity for this task we cannot expect the family physician in rural communities to make an early diagnosis. The detailed management and special methods of treatment should be taught by the tuberculosis specialist.

If the professor of medicine is to be required to teach tuberculosis he must have a daily clinical contact with the disease. Every teaching hospital should provide beds for diagnostic study and temporary care of tuberculous patients. Fortunately for the modern medical student the doors of Necker Hospital were not closed to pulmonary tuberculosis in Laennec's day. Every tuberculosis dispensary and every available sanatorium bed should be pressed into service. With such an arrangement the student could learn under the professor of medicine the diagnosis, the broader principles of treatment and the general importance of the disease in every day practice. With a two or four weeks' residence in a well-managed sanatorium he would have opprtunity for further diagnostic training, a study of prognosis, routine management, social significance and special forms of treatment. In answer to the question, "What can a student do in two weeks?" I quote David A. Stewart of Manitoba, who has had fourteen years' experience with medical students, traveling 150 miles for two weeks' residence in the sanatorium:

"An ordinary routine was that of four students of whose work a count was made. They made rounds 28 times; shared in the examination of 58 patients; wrote 20 histories and 38 summaries; saw pneumothorax begun in 2 patients and 83 'refills;' saw more than 150 fluoroscopies of the chest; shared in the study of 90 sets of new plates of chest, spine, head, teeth and barium meals; helped with the tuberculin treatment

of a class of 30; helped with 1 spinal puncture and examination of fluid; with 3 basal metabolism estimations; with blood counts, sputum examinations, and examinations of the larynx. They had the benefit of a general review of patients in a three-day visit of the two consultants. And ten informal talks were given them on the scope of sanatorium work, artificial pneumothorax, physical signs, pleurisy, intestinal tuberculosis, tuberculin, meningitis, septic infection of the bronchial tract and prognosis of tuberculosis."

If necessary to make room for this two weeks' residence in a sanatorium, I would suggest that certain hours be cut from some of the specialties or that the students be taken from the bleachers of the surgical amphitheatre, "probably the most useless survivor of a bygone age."[6] There is little to be learned by gazing at the surgeon's interscapular region; by a fleeting glance at shifting coils of intestines or a dash of blood on a white sponge. Talking across an open incision may possibly be good teaching, but it is obviously poor practice.

CONCLUSIONS

(1) The medical student should be taught to supplement "intuitive sagacity" and as far as possible eliminate empiricism by the acquisition of knowledge through the fundamental methods of physical examination. The application of these methods is ideally accomplished through the clinical study of tuberculosis.

(2) The established agencies for the study and the control of tuberculosis, and medical schools should be in closer cooperation in order that all accumulated knowledge and all available material may be placed in the path of the medical student. Conscientious cooperation would forward the interests of both the agencies and the medical schools, through coordinated effort and the consequent discharge of mutual obligations to society.

This plan would soon render inexcusable the charge of inefficiency and lack of knowledge on the part of the family physician with reference to tuberculosis.

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LOCATION OF PRIMARY LESION IN FIFTY-THREE CASES OF MALIGNANT MELANOMATA*

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Since the term "melanoma" was first used by Virchow[1] to designate all kinds of pigmented neoplasms, there have been constant efforts by the leading histopatholgists to derive at a classification of these tumors based upon their cellular origin.

Unna[2] suggests that the melanomata arise from nevae cells of the stratum germinativum during the embryonal period. The cells extend into the dermis in a columnar mass where they are snared off, leaving an independent group in the connective tissue. The melanomata would therefore be of epithelial origin and are classified by him as melano-carcinoma. Among Unna's supporters can be mentioned Foster,[3] Gilchrist[4] and Abbesser.[5]

Ribbert[6] believes that there is one specific cell which gives rise to a pigmented neoplasm. This cell is mesodermic in origin and has the individual property to produce melanin pigment. This cell is called a chromatophore. The chromatophores are found throughout the body, but are most frequent and numerous in the epidermis, eyes and meninges of brain and spinal cord. On account of the mesoblastic origin of the type cell, Ribbert classifies all pigmented neoplasms as melano-sarcoma.

Jadasohn[7] and Johnstone[8] agree that the nevus cell is mesoblastic in origin, but claim it is not a specific cell but differs from the ordinary mesoblast only in that it has assumed the pigment-producing property.

Krompecher[9] and Kromayer[10] believe in the epidermal origin of the nevus cell, but point out that the original epidermal cell undergoes a degenerative process until it resembles the spindle-shaped connective tissue cell in appearance.

Acton[11] points out that the nevus and malignant melanoma is composed of two different types of cells which he calls melanoblasts and angioblasts. Thus the new growth might be of dual origin resembling a melanoblastic or angioblastic tumor, depending upon which type of cell predominates.

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Von Recklinghausen is of the opinion that the nevus cell is derived from the endothelial lining of the lymph vessels and lymph spaces. He points out the similarity between the branching of the lymph vessels and the columnar growth of the melanomata.

At the present time, due to absence of definite proof concerning the derivation of the melanoma type cell, and as the result of the confusion caused by using alternatively such terms as melano-carcinoma, melano-sarcoma, nevi-tumor, malignant mole, and so forth, it seems best to use the term malignant melanomata to include all metastasizing growths which originate directly or indirectly from a nevus, or which contain melanin pigment. This leaves the true nature of the melanoma type cell to be accurately determined and established by future investigation.

All nevi which begin to show any signs of malignant degeneration (increase in size or thickness, change in color, ulceration, hemorrhage) must be removed at once in order to prevent extension and metastasis. After local extension has taken place, even radical surgical removal seems to be of little avail. It therefore seems of significance to emphasize the sex, age and location of the primary lesion in a representative number (fifty-three cases) of malignant melanomata.

On ten cases necropsy had been performed, five males and five females.

TABLE I

AGE IN YEARS

	Males	Females
Youngest	29	33
Oldest	65	61
Average	54.2	54.6

Average both sexes, 54.4.

The age incidence is that usually emphasized in considering malignancies, that is, from 30-70 years. It seems unusual to find the same number of males and females afflicted with the same disease who reached practically the same age.

TABLE II

LOCATION OF PRIMARY LESION IN TEN NECROPSY CASES

Location	No. of Cases
Head—Five Cases (50 per cent):	
Right eye	3
Left eye	1
Right temporal region	1
Trunk—Three Cases (30 per cent):	
Left shoulder	1
Ampulla of Vater	1
Midway between umbilicus and ensiform cartilage	1
Superior Extremities—None	
Inferior Extremities—Two Cases (20 per cent)	
First digit right foot	1
Left leg lateral surface just above ankle	1

Five cases, or 50 per cent, of malignant melanomata were located in positions on the skin where they could be easily and thoroughly inspected and early changes could be observed. Malignant melanomata are in this series found more frequently in the eyes than in any other organ. In any case of increased intra-ocular tension the fundus should be examined to eliminate the possibility of a malignant condition. In the five cases which developed from the skin there was in every case a nevus which gradually (one to six years) assumed malignant characteristics. Each case could have been saved if the nevus had been removed in the pre-malignant stage. Chronic irritation by clothing, shoes, collar, corsets and suspenders is a factor in causing malignant changes in a nevus. Metastasis were found in order of frequency in the lymph nodes, liver, viscera, lungs, bones, brain, spinal cord, kidneys, adrenal glands, muscles and heart.

In forty-three cases of malignant melanomata the primary lesion was removed by surgery.

TABLE III

AGE INCIDENCE IN YEARS

	Males	Females
Youngest	28	34
Oldest	77	68
Average	53.8	48

Average both sexes, 50.6.

The average age for both sexes is 3.8 years less than the cases which came to necropsy.

TABLES IV

LOCATION OF PRIMARY LESION IN FORTY-THREE CASES

Location	No. of Cases
Head—Seventeen Cases (39.5 per cent)	
Right eye	5
Left eye	3
Conjunctive, lower left lid	1
Conjunctive, upper right lid	1
Eyelid, right eye	1
Pinna, left ear	1
One inch above left ear	1
Middle concha	1
Right cheek	1
Upper lip	1
Under right eye	1
Neck—Three Cases (6.9 per cent)	
Back of neck	1
Left side of neck	2
Trunk—Five Cases (11.6 per cent)	
Shoulder	1
Back	2
Lumbar spine, right side	1
Rectum	1
Genitalia—Three Cases (6.9 per cent)	
Labia	1
Right labia	1
Prepuce	1
Extremities—Fifteen Cases (34.8 per cent)	
Superior Extremity— Two Cases (4.6 per cent)	
Right arm, lateral aspect	1
Arm	1
Inferior Extremity—Thirteen Cases (30.2 per cent)	
Right Inferior Extremity—Seven Cases	
Right inguinal gland	1
Right leg, posterior surface	1
Right leg, calf	1

Right Foot—Four Cases	
Medial malleolus	1
Plantar surface	1
Foot	1
First digit	1
Left Inferior Extremity—Three Cases	
Foot	2
Dorsum of foot	1
Extremity Not Specified—Three Cases	
Digit I	1
Foot	1
Foot, plantar surface	1

Seventy and five-tenths per cent of all malignant melanomata of the head appear in the eyes or associated structures; 52.9 per cent, or more than one-half, appear in the eyes; 29.4 per cent appear on the skin in easily accessible places. The possibility of the collar's rubbing on a benign nevus of the neck should not be neglected as a possible factor in producing a malignant degeneration.

Eighty per cent of the malignant melanomata of the trunk were situated so they could be easily removed.

The feet are the site of the primary lesion in ten cases, or 20.9 per cent, of the total number of malignant melanomata on the entire body and 60 per cent of the melanomata found on the extremities. Twenty-six cases, or 60.4 per cent, of forty-three melanomata removed at operation originated either on the head or on the feet. Thirty-one cases, or 70 per cent, of the malignant melanomata are found on the skin and conjunctiva. This superficial location makes them easy to examine and makes early determination of malignant changes only a matter of careful observation. The number of malignant melanomata which have their primary lesion in obscure inaccessible places such as the brain, meninges, ovaries, or rectum, are, relatively speaking, so few as to make them pathological curiosities.

Among the general public there is not sufficient appreciation of the fact that if a nevus is located in a place where it is subjected to chronic irritation, the individual is a factor in producing a self-inflicted malignancy. Every mole, wart, nevus and birthmark located in a place where it is or may become irritated should be removed immediately by surgery. A wide margin of safety should always be included. In a number of melanomata incompletely removed, lanced or curretted, the manipulation has served as an immediate factor in changing a benign or premalignant nevus into an incurable malignant melanoma.

Table V is a follow-up record. Replies were received from twenty-three cases, or 53.5 per cent, of forty-three operative cases.

Nine patients died with metastases in from less than one to three years after removal of the primary lesion. One patient lived twelve years after the primary operation. One patient is liv-

TABLE V

AUTOPSY MATERIAL

Name of Patient	Location of Melanoma	Appearance of Melanoma	Date of Removal	Date of Death	Metastasis
R. Whitney A-724	Right eye	.....	12 years before death	.....	To liver and intestines
Mrs. L. M. Sorass	First digit right foot	Small ulcer	1909	1911	To skin, peritoneum, lymphatics, liver, thyroid, ileum, kidneys, bones of pelvis, right groin.
A. L. Sheridan	Abdomen	Pigmented mole, 1-1½ in. in diameter	Present	1911	Liver and spleen
Mrs. E. Palmer	Left shoulder	Tumor mass, 4 cm. in diameter	June 1912	January 1913	General
Mrs. M. Boyd	Above ankle, left leg	Small tumor mass just above shoe	April 1918	1919	Extension to lymphnodes, spleen and adrenals
Mrs. G. Clendenin	Left eye	Black mass of cells in region of optic nerve attachment	August 1920	1920	To liver and right eye
M. Dunn	Intestines jeunum	Elevated yellowish nodules	.....	1921	To brain and intestines
Emil Peterson	Right temporal region	Rapidly enlarging pigmented mole	Jan. 7, 1921	1923	To Retroperitoneal lymphnodes and lungs
J. Olmgren	Right eye	.....	Advised enucleation 1921	1922	To liver
F. Treat	Ampulla of Vater and pancreas	Larke dark pedunculated mass 5 cm. in diameter	.....	1922	To liver and general

TABLE VI

OPERATIVE CASES

Name of Patient	Location of Melanoma	Appearance of Melanoma	Date of Removal	Present Condition
Mrs. Faber	Right side of lip	Small nodular masses, pigmented	Oct. 1, 1917	No record, Oct. 17, 1924
Mrs. P. O. Pederson	Right labium majus	Pigmented mole	1920	Died Oct. 1923. Had metastases to viscera and one eye.
Mrs. O. J. Foster	Right cheek	Small wart-like elevation	1923	Living and well Nov. 1, 1924
Mrs. Besheass	Face and back	Pigmented mole	1921	Living and well March 10, 1923
Mrs. J. T. Gross	Arm	Cauliflower growth 2 cm. diameter, 1 cm. raised, pigmented	1922	Living and well
A. E. Wyler	Choroid	Minute subretinal growth which grew until it filled the vitreous chamber	June 5, 1914	Died in 1916
Mrs. Zastrow	Left side of neck	Large pigmented mole	Oct. 1919	Living and well
Mrs. H. Kerr	Right foot, plantar surface	Small brownish pigmented tumor	March, 1922	Living. Has metastasis controlled by x-ray
Mrs. E. H. Scott	Right eye	Brownish tumor, pedunculated, 5x7 cm.	April 12, 1922	Living and well
Mrs. H. N. Johnson	Pinna, left ear	Telangiectatic mass	March 9, 1921	Died April 1, 1924. Metastasis to viscera and skin
Mr. Cabot	Upper lip	Small flat pigmented area	1921	Living and well
Mr. Page	Calf of leg	Pigmented mole, 3.5 cm. diameter	May 17, 1919	Living and well
Mr. Kinney	Eye	Mass of spindle-shaped cells protruding into vitreous chamber	1922	Living and well

ing two years after removal of primary lesion, but has metastases probably in the liver. Three died from metastasis after the primary lesion was removed. The time factor was not determined. Eight patients are still living one to five years after the removal of the primary lesion. In the patients who died there were in each case extensive metastases. The liver was always involved. At present all treatment of malignant melanomata after extension appears futile. The only course which offers any hope is to remove the pre-malignant lesion by surgery before extension has taken place. In a large number of the cases studied, a long time (one to six) years elapsed between the patient himself noticed a definite malignant change such as increased pigmentation, hypertrophy, ulceration, hemorrhage, extension or metastases before he sought the advice of a physician. The number of deaths from malignant melanomata can be decreased by insisting on the thorough surgical removal of all degenerating nevi and pigmented areas exposed to chronic irritation.

Note: I gratefully acknowledge aid and suggestions from Prof. E. T. Bell, Director of Department of Pathology, University of Minnesota.

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THE INFANT MASTOID AS A FOCUS OF INFECTION*†

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Gastro-intestinal disturbances in infants may be caused by direct enteric infection, improper feeding, or some parenteral infection. When the trouble is due to a parenteral focus, the history is usually one of failure to gain normally in weight, with more or less serious gastro-

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intestinal symptoms, from time to time; and, in the severe cases, marked loss of weight, vomiting, diarrhea, anhydremia, extreme toxicity and a septic temperature often going as high as 104 or 105°. These symptoms do not yield to any regulation of feeding, but do subside after the elimination of the infected focus. This parenteral focus of infection is frequently in the ear or in the upper air passages, or both. This paper is limited to the consideration of cases in which the focus of infection is in the ear and mastoid, but if any nose and throat infection is present it should be treated at the same time, or we cannot expect good results.

Autopsies in these cases show nothing in the gastro-intestinal tract to account for the symptoms, but do show pus in the middle ear and mastoid antrum. The otologic picture in these cases is usually well defined, but presents certain differences from that of mastoiditis in adults.

In the infant, the membranous canal is attached directly to the annulus tympanicus, there being no bony canal at this age. The squamous portion of the temporal bone does not yet project horizontally, as in the adult, and the annulus tympanicus is almost in the same plane as the superior wall of the membranous canal. The superior and inferior walls of this canal lie almost in apposition, so that it is necessary to pull the auricle downward and backward in order to obtain a view of the drumhead. Only the anterior portion of the drumhead shows through the otoscope. That portion lying posterior to the malleus is practically in the same plane as the superior canal wall and cannot easily be seen unless it is bulging. Any bulge in this posterior portion of the drumhead will be downward instead of outward, as in the adult, and will simulate a sag of the canal wall. Because of the shape of the temporal bone in infants, the antrum is usually nearer the outer surface of the skull than it is to the canal wall. Consequently a true sag of the canal wall is rarely seen in infants, although occasionally the development of the bone may be such that this can occur. However, the significance of this bulge downward is identical with that of the sag of the canal wall seen in adults: that is, it signifies an infection of the upper tympanic space and antrum.

Sub-periosteal abscess is rare in this particular type of mastoid infection, although it is one of the most common and often the first recognized symptom of mastoiditis in infants, unaccompanied by gastro-intestinal disturbances. The drumheads in these cases are usually red and bulging. If the infection is in the lower part of the tympanum, the bulge may be in the anterior portion of the drumhead and be outward, as in the adult, but if the infection is in the posterior portion the bulge will be downward in the infant and will simulate a sag of the canal wall. Incision through this portion of the drumhead usually reveals a thickened membrane, or even solid tissue. There is usually an escape of pus, or a bloody, ropy fluid. The embryonal tissue within the tympanic cavity quickly obstructs drainage, and the next examination may again show a bulging drumhead. If the infant is extremely dried out, the drumhead may have a dull, dirty gray appearance, and there may be no bulging. Incision of such a drumhead will usually release pus. We believe this peculiar, grayish appearance of the drumhead is but a part of the general anhydremia of the infant.

In the embryo, the tympanic cavity, attic and mastoid antrum are filled with embryonal tissue. This tissue begins to be absorbed at about the time of birth. The absorption starts in the lower part of the tympanic cavity, but is not completed in the attic and antrum until between the first and second year. We believe that this accounts for the fact that many cases of gastro-intestinal disturbances in infants, which are due to otitic infection, are relieved by myringotomy when the infection is limited to the actual cavity which has been formed in the middle ear, but that if the infection invades the solid embryonal tissue in the upper part of the tympanic cavity and mastoid antrum, drainage through the drumhead is inadequate, and absorption from this focus continues unless the mastoid antrum is opened and the contents are removed to establish through-and-through drainage.

The examination of an infant's ear is rather a difficult procedure and requires good illumination. We have found it advisable to wrap the infant in a sheet and use an electric otoscope, which assures brilliant illumination and a slight magnification of the image of the drumhead, which brings out details or variations from the normal, which might otherwise be overlooked. If the infant is in fairly good condition, a myringotomy should be done on one or both ears if they show signs of infection. This should be followed by hot saline irrigations every two hours, if the infant is awake, to maintain drainage.

The pediatric care of these cases, which is most important, consists in the giving of a proper diet, the injection of normal saline or Ringer's solution subcutaneously or intraperitoneally, the injection of glucose intravenously, exposure to ultra-violet light, and blood transfusions, if available. Special care is taken to maintain the body heat. In many cases the only otologic procedure necessary is this myringotomy, which may have to be repeated if the incision closes. If, however, the infant does not improve, or if it is in bad general condition when first seen, we believe it safer to open the mastoid antrum at once, as valuable time may be lost by delay. This is not so formidable a procedure as might be thought and, with the technic which has been used, we do not believe that any of the fatalities have been due to the operation.

Most of these infants are in very bad condition, and many of them have a coincident upper or lower respiratory infection, and a general anesthetic is out of the question. Therefore, they are all done under local anesthesia.

The technic in its present development is as follows:

(1) If there is no contra-indication, the infant is given a small dose of codein or morphin thirty minutes before the operation.

(2) The scalp is shaved over both mastoid areas.

(3) The skin is disinfected with 5 per cent picric acid in alcohol.

(4) The skin immediately behind the auricle is infiltrated with 0.5 per cent novocain containing eight drops of epinephrin to the ounce. A deeper injection is made beneath the periosteum overlying the antrum.

(5) The incision is made immediately behind the auricle beginning opposite the external auditory meatus and extending upward about three-fourths of an inch. It is important that the incision be higher than the usual mastoid incision. The mastoid process is not yet developed, the facial nerve lies in an exposed position after its exit from the fallopian canal, and may easily be injured if the excision extends lower than the middle of the external auditory meatus.

(6) The bleeding is carefully checked and the wound inspected to make certain that the periosteum has been incised. If this has not been accomplished, it is now done.

(7) The periosteum is carefully elevated from the incision forward and downward with a small elevator, such as is used in submucous resections, until the posterior superior arc of the auditory meatus is exposed.

(8) The soft tissues anterior to the incision are then retracted downward and forward with a Cushing's vein retractor. This gives a good exposure of the bone overlying the antrum. The supra-meatal spine is usually not developed at this age, but there is a small depression with several foramina in the bone overlying the antrum.

(9) An imaginary horizontal line is drawn backward from the top of the superior border of the auditory meatus and an imaginary vertical line extended upward from the posterior border of the bony meatus. At their point of intersection a small button of bone is removed by means of a 7 mm. hand-gouge. This hand-gouge is used to avoid the concussion incident to the use of the mallet. This usually uncaps the antrum. If not, the opening in the bone is enlarged and deepened until that cavity is reached. All bone chips are carefully saved for pathological examination.

(10) As soon as the antrum has been uncapped, a culture is taken.

(11) A small curette is used gently to remove the contents of the antrum and to take away the overhanging bone.

(12) A probe is passed through the *aditus ad antrum* to be sure that retro-auricular drainage has been established.

(13) A rubber or gauze drain is inserted into the antrum and a dry dressing applied. Usually no sutures are required. These cases are dressed daily and care is taken to keep the mastoid open until all discharge from the ear canal has ceased. If the antrum is allowed to close too soon, the remaining infection may light up and the operation have to be repeated.

The healing time varies greatly, some being completely healed in from ten days to two weeks, and others requiring a much longer time. One case required one hundred and twenty days. Frequently this delay in healing is due to a coincident infection in the upper respiratory tract. The use of mercurochrome in the mastoid cavity has apparently proved helpful. General pediatric care following the operation is most important, the mere dressing of the mastoid wound being a simple routine procedure.

Most of these cases have been bilateral, and the few in which only one antrum was opened have nearly all required a similar operation on

the opposite side later. The antra contained either frank pus or a thick, ropy fluid.

Dr. B. J. McMahon, who has made a careful examination of the bone and antral contents of these cases, states that extensive involvement of the bone is quite unusual, although one case in an infant six weeks old, in which the antral contents had been completely destroyed, did show an actual bony necrosis involving the entire antral wall. The antral contents show either a marked edema or fibrotic changes, and he makes the interesting observation that the cases of mastoiditis with gastro-intestinal disturbances, in which the antral contents are edematous, have an extremely high rate of mortality, while those in which fibrotic changes have occurred have a high rate of recoveries. This, he thinks, is due to the fact that the edematous tissue permits further absorption into the system of the toxins, while the fibrotic changes form a more efficient barrier. Curiously enough, however, in cases of mastoiditis without gastro-intestinal symptoms, this difference in pathology makes no difference in the mortality, as all of the cases of mastoiditis without gastro-intestinal symptoms, except one, recovered, and this one death was due to conditions entirely distinct from the mastoid infection.

The lack of bone changes is one of the reasons why the x-ray has not been of any material assistance.

Dr. Alexis F. Hartmann, of the St. Louis Children's Hospital, has made some very important and interesting findings in his study of the blood chemistry in these cases. In a recent communication to the writer he says:

"Our present ideas concerning the chemical changes in the body which we find associated with mastoiditis in infancy are as follows:

"When that particular type of infection is present, there occurs as a result of absorption from the infected focus marked vomiting and diarrhea. As has been shown previously by Dr. Marriott, during periods of infection in most infants very little hydrochloric acid is secreted into the stomach. Consequently, in such cases as these, marked vomiting can occur without loss of chlorid from the body. The diarrheal stools undoubtedly consist not only of ingested food but of water that has come from the blood and tissues, and more particularly pancreatic and intestinal secretions. Pancreatic juice is rich in sodium bicarbonate, and when this is not reabsorbed, as it is normally, there can occur, as a result of frequent diarrheal stools, loss of sodium bicarbonate from the body. This, of course, leads to acidosis.

"The usual chemical picture seen in the blood of these cases before treatment of any kind is instituted is a somewhat reduced chlorid content, a more greatly reduced bicarbonate content, reduced water content, and a slight increase in lactic acid. If the reduced water content of the blood and tissues is treated by frequent administration of normal salt solution, or Ringer's solution, while the infection with its chief symptoms of vomiting and diarrhea still persists, there continues to occur loss of water from the body and loss of bicarbonate, and perhaps slight loss of chlorid, but the chlorid intake in the form of salt solution far exceeds its loss. There then results an accumulation of chlorid in the blood and tissues. This tends further to keep reduced the already low bicarbonate content. As a result, we see a very severe and persistent acidosis which first was caused chiefly by loss of bicarbonate and which has been increased by retention of chlorid in the body. In this latter stage one may very well speak of the condition as being a severe hydrochloric acid acidosis.

"This type of acidosis must be treated in a different way from other types. Since hydrochloric acid is the strongest acid that exists in the body, and since it can be removed practically only through the kidneys, the first essential is to provide the patient with enough water so that a good urinary output can be established. This usually can be done only by frequent administration of intravenous glucose, and water by mouth and by rectum. Usually the vomiting makes unsuccessful the attempts to give water by mouth, and the diarrhea likewise prevents the administration of water by the rectum. Because of the high chlorid content of the body, it is necessary to discontinue all salt solution administration, and because of the actual loss from the body of sodium bicarbonate, it is necessary to give this substance, and it may best be administered intravenously, as definitely measured amounts can thus be given without danger of producing alkalosis.

"These measures may be looked upon as entirely symptomatic treatment in an effort to relieve the acidosis and to restore the normal water to the body, and are to be used in conjunction with the drainage of the mastoid. Together with transfusions, they constitute life-saving measures, since in most cases recovery from severe vomiting and diarrhea does not occur immediately after opening the mastoid."

Dr. Mary Spahr has carried out the bacteriological studies in these cases. The majority of the infections have been due to a hemolytic streptococcus. At first it seemed to us that there was some specific strain of hemolytic streptococcus which produced these gastro-intestinal symptoms, but further studies during the last year have shown that many other organisms produce the same effect. Seventeen different organisms were isolated from our mastoid cases during the last winter, and all of them occurred in cases both with and without gastro-intestinal symptoms. The occurrence of these cases in epidemics has been a very striking feature, and we feel that there is further knowledge to be obtained from bacteriological study.

The decision to operate in these cases can sometimes be arrived at by a study of the otological picture alone, but usually it requires the close cooperation of the otologist and the pediatrician, taking into consideration the ear pic-

ture, the general condition of the patient, and the progress of the case from day to day.

We do not wish to be understood as stating that all cases of diarrhea and vomiting and loss of weight in infants are due to mastoid infections and require mastoid operations, but we do believe that there is a type of this trouble which is due to parenteral infection, and that parenteral infection is frequently in the ear and mastoid.

In conclusion, we urge careful and repeated examinations of the ear, nose and throat in infants suffering from gastro-intestinal disturbances, and the closest cooperation between the pediatrician and the otologist.

DISCUSSION (*Abstract*)

Dr. F. H. Newton, Dallas, Tex.—I have had no experience in this work, but I should like to ask Dr. Lyman to give us the differential symptoms of the case in which the mastoid is the primary cause of the intestinal disturbance, and the case in which the mastoid involvement is superimposed upon the gastro-intestinal condition due to the extremely lowered resistance of the patient.

Dr. G. Madison Maxwell, Roanoke, Va.—About a year ago an article appeared in the *American Journal of Pediatrics* on this same subject, and in that article it was advised to use the internal route, going into the antrum through Shrapnel's membrane. I should like to hear a comparison of the two methods. Is not the external operation unnecessary if you can do the same thing through Shrapnel's membrane?

Dr. Lyman (closing).—In the series I had last winter of forty-three cases, thirty showed well marked gastro-intestinal symptoms and thirteen had no gastro-intestinal symptoms. Of course, the pediatricians as well as the rest of us know that a great many cases of vomiting and diarrhea are due to other causes than parenteral infection. This I did not touch on at all. My paper was distinctly limited to those cases in which the focus of infection was in the ear and mastoid.

In regard to going into the antrum through the ear canal, to me it seems much safer to make a small incision behind the ear where you can see exactly what you are doing and work in the open instead of in the dark, just as I prefer to do an adult mastoid by going in behind the ear instead of going in through the canal and attempting to open the antrum through the auditory canal.

The anatomy of the temporal bone of these babies varies considerably. Sometimes there will be not only an antrum but two or three secondary cells surrounding the antrum. If you go in through an external incision, you have the whole field before you and can open up all the cells which have developed, so I think it is much safer and more thorough. It will surprise you how simple the operation is. We have had no alarming reactions following the operation.

PELLAGRA IN INFANCY AND CHILDHOOD IN THE UNITED STATES*

By CHARLES JAMES BLOOM, B.Sc., M.D.,
New Orleans, La.

Though pellagra had been recognized as a disease for more than two hundred years, and many countries the world over had been affected by its presence, the United States of America knew nothing of its endemic nature until 1907.

While I was a student in the summer of 1911, infantile pellagra was first brought to my attention. Immediately my interest was aroused and a search for literature on the subject was begun. But little matter pertinent to children could be found, although at this time any number of articles in English were being published.

This was the incentive, the stimulus for this, the first of a series of articles on pellagra to be published.

At that time, three of my professors, Drs. Isadore Dyer, Charles C. Bass and William H. Harris, were contributing much advice as to means of recognition of the disease and research upon the recently discovered malady. Their findings and opinions have been quoted by the most authoritative works in this and in foreign countries. In recognition of their achievements and because pellagra is a southern or semi-tropical disease, and most of the cases in the country have occurred within the confines of the Southern states, this contribution is affectionately dedicated to our Alma Mater, the Tulane University of Louisiana, and to all others who have, either through personal sacrifices or munificent gifts, contributed greatly to the knowledge of the disease complex in this country.

As yet, much scientific uncertainty exists about pellagra. There is an apparent lack of interest, an absence of recent literature in our journals, no real experimental work is being performed. Textbooks, with few exceptions, omit mention of the disease entirely. Others do not contain authoritative data.

The statements that the disease is not now prevalent in this country, that infants and children seldom contract it, that the death rate is practically nil, that cases are diminishing yearly, that *pellagra sine pellagra* does not exist, that the etiology is known and that a special plan

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*Read in Section on Pediatrics, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

of treatment is accepted, are without foundation.

The description of my cases and the interpretation of signs and symptoms are not final. They are described in the hope that renewed interest will be given to those who still believe the subject worth while.

Pellagra is an endemic disease, occurring usually in temperate and sub-tropical countries, characterized by rather definite dermatological lesions in combination with gastro-intestinal disorders and nervous phenomena of various types and intensities. Recently we have been prone to accept the condition of *pellagra sine pellagra,* either for the reason that one does not see cases in their incipiency, or else the skin symptoms are entirely wanting.

The origin of the word pellagra is still in dispute, the derivation being either Italian, Greek or Latin. By most authorities it is accepted as a word of the common people of Italy, first used in 1771 by Frapolli in the phrase "morbus vulgo pellagra"—"a disease among the people called pellagra." *Pellis* (skin), agra (rough); *pelles* (skin), *agra* (catching or seizure); *pellis* (skin), *agra* (sour), the resemblance of the skin to the rind of citron and lemon; *pella* (skin), *agra* (unsightly). *Pelle* and *pella* instead of *pellis,* and *agro* as a substitute for *agra* are sometimes seen. However, *pelle agra* is the Italian nomenclature.

More than eighty synonyms were given by the people of many countries as the disease became recognized in the different parts of the universe. Spain, Italy, France, Rumania, Germany, Greece and Egypt have numerous synonyms for the one disease. Some include names referable to other diseases (scurvy, leprosy, rickets, erysipelas) and to climatic environments.

HISTORY

The Asturian Hippocrates, Gaspar Casal, was born in 1679 and died in Madrid in 1759 at the age of eighty years. The first description of pellagra is historically credited to him, though Thiery, a French physician, published an account of Casal's observations as early as 1755. Gaspar Casal's book, "A Natural and Medical History of the Asturias," was not published until 1762. Written originally in Latin and translated later into Spanish, the famous masterpiece of early medical literature still lives with those interested in this disease, and no better early description of pellagra has been given to posterity than that included in the chapter, "Mal de la Rosa."

The history of pellagra is unique, its distribution is peculiar, and its manifestations are different. There has been apparently an unusual chronological incidence of this malady in the many countries wherein it has been seen.

At first diagnosed in Spain around 1700, the "horrible and obstinate disease," "an affliction which is hurrying whole populations to the grave," flourished there until 1900, for two centuries.

Italy was next the scene of this "one of the cruelest diseases that God ever sent to man." From 1700 through 1881, forty-four out of sixty-nine provinces were visited, and though the number and deaths have been materially reduced, pellagra as such is still recorded in this country.

From 1818 to 1890, France was next in the path of this "murderous disease." Southwestern and southern provinces were principally affected.

Austria and Hungary in turn loomed up in pellagran history. From 1830 to 1905, first in the western portions, then later in the eastern portions, pellagra claimed many victims.

Egypt and surrounding states, from 1847 to 1900, contributed valuable information on this disease complex.

And now the world revolves. The scenes are shifted to the western hemisphere, the American epoch.

HISTORY AND GEOGRAPHICAL DISTRIBUTION OF PELLAGRA IN THE UNITED STATES OF AMERICA

Henry Holland, an Englishman, in 1817, wrote a paper entitled "On the Pellagra, a Disease Prevailing in Lombardy." This article was first published in London and reproduced in Philadelphia in 1818. This probably was the first English paper and the first issued in the United States. It is altogether likely that the malady occurred sporadically in America for many years before its earliest recognition.

The first meagre reports of pellagra are questioned. It was reported as early as 1828-1834 by Dr. J. W. Babcock. Union soldiers in 1865 at Andersonville, Ga., were stricken with a disease in keeping with pellagra, with a high morbidity and mortality, and reported by Dr. W. J. W. Kerr, of Corsicana, Texas.

The first authentic case, however, was recorded by Dr. John T. Gray, of Utica, N. Y., and a second case verbally reported by Dr. Tyler, of Summerville, Mass., both in 1864. Dur-

ing the Civil War, Confederate soldiers in large numbers were similarly affected by a disease then prevalent among the enemy's armies, and a few years afterwards, in 1870, many veterans in the South Carolina Asylum at Columbia were stricken. This was the report of Dr. H. N. Sloan, of South Carolina. Dr. D. S. Pope, of Columbia, S. C., says that at least two cases occurred in the South Carolina penitentiary in 1880-1885.

Sporadic cases continued to be diagnosed. Dr. S. Sherwell, of Brooklyn, in 1883; Dr. S. Bemiss, of New Orleans, in 1889; Dr. T. R. Mask, of Wilmington, N. C., in 1889; and Drs. R. H. Bellamy and E. J. Wood of Wilmington, N. C., in 1889, each reported one. Again in 1902 Dr. S. Sherwell recognized another case. About that time Dr. H. F. Harris, of Atlanta, wrote a monograph on "A Case of Hookworm Disease Presenting the Symptoms of Pellagra."

Pellagra in the epidemic form was first noted by Dr. George H. Searcy (1906-1907) at an asylum for negroes in Mount Vernon, Ala. Associated with him were Drs. Somerville and E. L. McCafferty of his staff, assisted by Drs. E. D. Bondurant, of Mobile, and Isadore Dyer, of New Orleans, La. There were eighty-eight cases with a fatality of fifty-seven. Another outbreak took place in Alabama at the Bryce Memorial Hospital in the same year. The corroborated findings were read before the meeting of the Alabama State Medical Association, April 19, 1907.

Texas was next visited, Dr. T. C. Merrill having diagnosed a sporadic case (1907). Drs. J. W. Babcock and J. J. Watson, of Columbia, S. C., noticed the disease during this eventful year at the State Hospital for the Insane at Columbia, S. C. Their interesting and comprehensive report initiated the beginning of a widespread interest throughout the United States.

The following year (1908) they journeyed to Italy and for the first time diagnosed the American and Italian disease as one and the same pellagra.

Dr. E. J. Wood (1907), of North Carolina, before the American Medical Association, reported a case that was finally reckoned as pellagra.

The *Journal of the American Medical Association* came to the fore, and within a short lapse of weeks cases were being reported to the magazine from many new localities and from additional states where the disease had not been discovered up to that time. In 1908, before the American Medical Association, Drs. R. H. Bellamy and J. B. Wright, of Lincolnton, N. C., read a splendid paper and reported five cases which they had studied since 1905. Dr. N. V. Moore, of South Carolina, also noted pellagra in 1908.

The attention of the prevailing epidemic was next brought to the notice of Dr. C. H. Lavinder, of the United States Public Health Service, then stationed at Wilmington, N. C. Through the courtesy of the local physicians, he was given the privileges of personal study of their cases. When the late Surgeon-General Wyman was informed of this far eastern visitation, he at once gave orders that Dr. Lavinder issue a preces for immediate publication. Foreign literature was translated and the important facts of the malady, historical as well as scientific, were included in the booklet which was distributed throughout the states. Associated originally with him were Dr. J. F. Siler and Dr. H. J. Nichols.

Under the auspices of the State Board of Health of South Carolina, a conference on pellagra was held in October, 1908, and subsequently in 1909 a national conference on this "American leprosy" met in Columbia, S. C. A short report came from Dr. W. F. Drewry, of Petersburg, Va., in 1909.

Everyone now was aroused. Isolated and epidemic foci were being reported from many states. The rapidity of increase of this disease was striking during the years 1908 to 1912. Of forty-nine states, including the District of Columbia, thirty-three reported cases. The states free from the disease were: New Hampshire, Connecticut, Delaware, Nebraska, Michigan, Minnesota, North Dakota, South Dakota, Montana, Wyoming, New Mexico, Idaho, Utah, Nevada, Wisconsin and Oregon.

The outbreak extended from Maine to California and from the Great Lakes to the Gulf of Mexico. The Southeastern and Southern states were the hot-beds of the new clinical syndrome. North Carolina, Alabama, Mississippi, Louisiana, Kentucky, Tennessee, Texas, Arkansas and South Carolina, each reported more than five hundred cases up to 1911.

Additional special commissions for the study of pellagra were appointed by the Governor of Illinois, by the North Carolina Board of Health, by the Tennessee Board of Health and by the New York Post-Graduate School. Under the guidance of the latter school, and through the generosity of Col. Robert M. Thompson, of New

York, and J. H. McFadden, of Philadelphia, investigations of untold value were begun. They acted under the title of the Thompson-McFadden Pellagra Commission, issued two reports, and the Robert M. Thompson Pellagra Commission was responsible for the third and last report. This admirable work was performed by Drs. J. F. Siler, P. E. Garrison, W. J. MacNeal, E. B. Muncey and E. Vedder, with the collaboration of C. B. Davenport. These reports summarized the original researches for 1913-14, 1914 and 1916-17, respectively. Coincident with the work of these commissions, Dr. Joseph L. Goldberger, of the United States Public Health Service, was carrying on independent investigations, with Dr. G. A. Wheeler as an associate.

ETIOLOGY

The many theories offered as to the etiology of pellagra are mentioned as a matter of passing interest to those of us whose knowledge of the disease may be wanting at this time. No attempt will be made to discuss this important phase of this disease.

THEORIES

I. Maize (Corn-Zeist) (Principal Ones) (Modified after Deaderick and Thompson).

(1) Insufficiency of nutritive elements (Fanzago).
(2) Monophagism (Morelli).
(3) Toxicity of normal corn itself (Selmi).
(4) Toxicity of corn due to germination process.
(5) Toxicity due to products elaborated by action of certain micro-organisms (maize smut, *Bacterium maydis, Bacillus Pellagrae, Streptobacillus pellagrae,* etc.
(6) Auto-intoxication due to end-products by the toxicity of corn in the alimentary tract (Neusser).
(7) Unleavened bread (Faye).
(8) Toxicity due to seed of noxious weeds gathered with the grain (Snyder).
(9) Toxicity of corn due to poisonous substances in the grain which act only after being sensitized by rays of sun, etc.

II. Special form of scurvy (Odoardi).
III. Rancid oils, poverty, poor hygiene (Strambio).
IV. Impure air, moisture (Thouvenel).
V. Insolation, action of sun's rays (Frapolli).
VI. Spoiled food, lack of wine (Gherardini).
VII. Accumulation of heat in the blood (Del Camp).
VIII. Accumulation of acids due to faulty excretion (Boerhaeve).
IX. Action of poisonous weeds on exposed surfaces (Snyder).
X. Semi-dried edible oils (Mizell).
XI. Sand-fly (Sambon).
XII. Buffalo-gnat (Garman).
XIII. Stable fly (Jennings and King).
XIV. Water-born nematode (Alessandrini).
XV. Ameba (Long).
XVI. Mosquito (Roberts).
XVII. Pathogenic trypanosomes transmitted by blackbirds (Ravitch).
XVIII. Colloidal minerals (Scala and Perdue).
XIX. *Bacillus welchii* (Holmes).
XX. Accumulation of electricity in blood (Vay).
XXI. Inanition caused by misery and filth (Soler).
XXII. Water of vegetation (Rozier).
XXIII. Vitamin lack (Funk).

CLASSIFICATION

Pellagra is now accepted as a general disease, occurring in most parts of the world, attacking many races, and exhibiting no discrimination for age or for sex.

Though it is found in the comparatively warmer climates, pellagra is not limited to the tropical zone. As yet no record of a case has been reported from the colder latitudes. None the less, interesting is its seasonal incidence, rather definitely in spring and autumn, suggesting the action of the actinic rays of the sun as a possible exciting cause in the production of the erythema.

Cold weather will retard the outbreak and warm weather will initiate an early season. During the months of May and June, the number of cases is the greatest, and they are more severe. The incubation periods, the stages and the types are omitted for the sake of brevity. The subacute and especially the chronic are the types recorded in infantile pellagra.

In my researches I have seen some children who presented the general symptomatic picture of pellagra, but did not exhibit any cutaneous manifestation of it. They were children of varying age, who gave indications of progressive prostration, of heaviness of head, vertigo, were sad, irritable, very excitable, with tremors both of the tongue and of the extremities, pains in the back, exaggeration of reflexes and diarrhea. The onset, the course of these symptoms, illustrated the pellagra periodicity with ameliorations and exacerbations in the fall.

CHART I.—PELLAGRA

Number of cases reported by State Health Departments to the United States Public Health Service, and obtained by correspondence with the State Health Departments, for states in which any considerable number of cases occurred, 1909-1926.

	1909	1910	1911	1912*	1913	1914
Alabama						500
Arkansas						
Florida	40	99	86			
Georgia						
Louisiana						115
Mississippi						10,954
Oklahoma						
S. Carolina					1,555	2,766
Tennessee						
Texas						
Virginia						

	1915	1916	1917	1918	1919	1920
Alabama	1,896	909	1,604	1,125	618	426
Arkansas						
Florida				67		
Georgia						
Louisiana	1,136	320	277	199	175	199
Mississippi	15,831	7,707	11,634	8,340	5,855	5,887
S. Carolina						
Tennessee						
Texas						
Virginia						

	1921	1922	1923	1924	1925**	1926**
Alabama	492	453	586	569	1,148	361
Arkansas		323	544	312	706	270
Florida		112		126	145	23†
Georgia					401	158
Louisiana	459	199	149	2,299	538	120‡
Mississippi	9,902	6,057	5,048	5,896	8,612	4,610
Oklahoma					313	245
S. Carolina						1,575§
Tennessee		590	563	742	325	343
Texas		221		665		
Virginia		204	253	181	189	129

*No data available.
**Provisional.
†Except January.
‡Except March.
§March-June.

STATISTICS (UNITED STATES, STATE OF LOUISIANA, CITY OF NEW ORLEANS)

Pellagra was not a reportable disease in most of the states until recently, and, according to Edgar Sydenstricker, in charge of statistical investigations, United States Public Health Service, in a letter of November 5, 1926:

"The data are very fragmentary. I have not attempted to compute any rates from these cases for two reasons: first, because the reports do not include the same states from year to year; and second, because the completeness of reporting differs so widely in the different states that the number of cases reported is not an accurate index of the prevalence of pellagra. For any particular state, however, the yearly variation in the disease may be taken as an indication of the variation in its prevalence, particularly in those states where a considerable number of cases is reported."

This would, therefore, account for the statistical discrepancies in some of the splendid treatises on pellagra. Some of the authors' figures were estimations.

Various estimates of the total yearly number of cases in the states have been made: Roberts (1911), 10,000;; Lavinder, U. S. P. H. S. (1913) 30,000; Weston (1914), 30,000-50,000; Lehmann (Texas alone), 40,000-50,000; Deaderick and Thompson (1915), 25,000; Niles (1916), 40,000; unofficial U. S. P. H. S. (quoted by New York Times, July 31, 1921), 75,000 (1915) and 100,000 (1916). From information gained from many sources, my belief is that at the present time there are about 10,000 to 25,000 cases in the United States.

PELLAGRA

The number of deaths caused by pellagra in 1924 was 2,347, corresponding to a death rate of 2.4 per 100,000 estimated population, the same rate as in 1923. There was a considerable decrease in the number of deaths in 1924, as compared with 1923, for both the urban and the rural part of Georgia (respectively 76 against 123, and 258 against 314).

CHART IV

DEATHS FROM PELLAGRA IN THE REGISTRATION AREA*

CALENDAR YEAR	All Ages	Under 1 year	1 year	2 years	3 years	4 years	5 to 9 years	10 to 14 years
1924	2,347	7	4	5	3	4	21	25
1923	2,352	6	9	4	3	3	25	25
1922	2,640	11	7	4	5	4	24	29
1921	2,541	7	8	8	8	7	44	30
1920	2,322	3	7	4	6	7	43	34
1919	2,806	12	12	7	2	7	42	43
1918	3,741	22	18	12	12	9	58	51
1917	3,666	26	27	28	16	16	63	56
1916	2,390	8	15	6	3	4	31	22
1915	2,843	6	10	4	9	6	47	49
1914	1,550	3	8	2	3	2	26	19
1913	1,015	4	4	6		4	11	10
1912	674	1	1	3	1	1	9	5
1911	659	3	4	2		1	11	6
1910	368	1	1		1	1	4	5

*Exclusive of Hawaii.

CHART V.

(Recordation of Collected cases)

1908—Bellamy: Two other cases reported; no ages given; age 10-14 years, 1; race, black; North Carolina.
1911—Hartzell: Female, 1; institution; race, white; death rate, 1; Pennsylvania.
1911—Jones: Age 1-4 years, 1; Mississippi.
1911—Tucker: Youngest 6 years, 55 cases studied; Virginia.
1911—King: Youngest 3 years, 17 cases studied; orphanage; Tennessee.
1912—Savage: Age 2 months, 1.
1912—Haase: Three cases, 4, 6 and 8 weeks.
1912—Snyder: Age 2 months 1, 4 months 1, 5 months 1, 6 months 2, 1-4 years, 16, 4-7 years 5, 7-10

years 2, 10-14 years 3; 3 personal; 31 from 48 physicians; race, black and white; Southern States.

1912—Wood: 1-4 years, 1; female, 1; race, white.

1912—Mason: Twenty cases studied, under 12 years; Alabama.

1912—Colver: 10-14 years, 1; female, 1; institution; hospital; Michigan.

1912—Knight: Youngest 4 years; oldest 10 years; 5 cases in one family; male, 3; female, 2; Georgia.

1912—Bodenheimer: 1-4 years, 1; 4-7 years, 1; Louisiana.

1912—Cole: 1-4 years, 1; male, 1; institution; death rate, 1; Alabama.

1913—Grimm: 1-4 years, 32; 7-10 years, 47; 10-14 years, 34; male, 56; female, 57; institution; 125 children out of 1,426 cases; race, white; death rate, 8, 1 insanity; Kentucky, South Carolina and Georgia.

1913—Grimm: 1-4 years, 1; 7-10 years, 1; 10-14 years, 11; male, 7; female, 5; race, negro; death rate, 4; Kentucky, South Carolina and Georgia.

1913—Hayne: One case.

1913—Krauss: One case; one nursing infant; private; Tennessee.

1914—Weston: 4-10 years, 57 cases; orphanage; Southern States.

1914—Weston: Youngest 2 months; most of cases under 4 years; 11 personal, 4 cases from 77 physicians; Southern States.

1914—Waring: 4-7 years, 2; 10-14 years, 66; orphanage; 52 per cent of inmates had pellagra; Georgia.

1914—Lavinder: Of 15,870 cases, 412 were under 5 years.

1914—Thompson-McFadden: 1-4 years, 40; 7-10 years, 61; 10-14 years, 30; male, 71; female, 60; white in main part; Carolinas.

1914—Roberts: Age 5 months, 1.

1916—Goldberger: 209 cases; orphanages.

1916—Muncey: Age 10-14 years, 1; female, 1; South Carolina.

CHART III.—NUMBER OF DEATHS FROM PELLAGRA

Figures in parentheses in the columns are reference numbers to footnote explanations.

AREA	1924	1923	1922	1921
The registration area[1]	2,347	2,352	2,640	2,541
Registration states[2]	2,206	2,245	2,514	2,348
Cities in registration states[2]	558	597	688	610
Rural part of registration states	1,648	1,648	1,826	1,738
Registration cities in non-registration states	141	107	126	193
All registration cities[2]	699	704	814	803
California:				
Urban	13	14	6	9
Rural	15	19	7	6
Colorado:				
Urban	.....	.....	2	1
Rural	.....	4	2	4
Connecticut:				
Urban	2	2	.....	1
Rural	.....	.....	.....	.....
Florida:				
Urban	22	27	17	31
Rural	80	74	93	100
Georgia:				
Urban	76	123	149	(3)
Rural	258	314	349	(4)
Illinois:				
Urban	5	2	4	3
Rural	2	3	4	6
Indiana:				
Urban	.....	1	1	2
Rural	1	.....	.....	4
Iowa:				
Urban	1	.....	(4)	(4)
Rural	.....	3	(4)	(4)
Kansas:				
Urban	5	3	3	2
Rural	5	1	6	4
Kentucky:				
Urban	4	4	7	15
Rural	54	64	66	56
Louisiana:				
Urban	51	44	52	60
Rural	135	108	82	121
Maine:				
Urban	.....	2	1	1
Rural	2	3	6	7
Maryland:				
Urban	2	5	1	4
Rural	1	1	3	2
Massachusetts:				
Urban	11	9	6	13
Rural	1	2	3	.....
Michigan:				
Urban	5	5	1	2
Rural	.....	1	1	.....
Minnesota:				
Urban	1	3	1	1
Rural	.....	.....	1	1
Mississippi:				
Urban	56	50	90	115
Rural	378	359	360	568
Missouri:				
Urban	6	4	5	8
Rural	10	8	9	12
Montana:				
Rural	1	.....	.....	.....
Nebraska:				
Urban	.....	1	.....	.....
Rural	.....	1	1	1
New Hampshire:				
Urban	2	1	2	.....
Rural	2	1	1	.....
New Jersey:				
Urban	3	2	4	2
Rural	.....	.....	.....	.....
New York:				
Urban	13	13	4	12
Rural	4	1	4	7
North Carolina:				
Urban	65	46	74	84
Rural	216	193	256	254
Ohio:				
Urban	5	.....	3	2
Rural	2	1	2	1
Oregon:				
Urban	1	.....	1	.....
Rural	1	1	1	.....
Pennsylvania:				
Urban	6	6	5	4
Rural	3	2	.....	2
Rhode Island:				
Urban	1	1	2	4
Rural	.....	.....	.....	.....
South Carolina:				
Urban	121	133	157	129
Rural	215	194	270	238
Tennessee:				
Urban	56	64	57	70
Rural	207	234	216	259
Utah:				
Urban	.....	.....	1	.....
Vermont:				
Urban	.....	.....	.....	.....
Rural	1	1	.....	2
Virginia:				
Urban	23	25	28	32
Rural	52	53	80	87
Washington:				
Urban	.....	.....	1	.....
Rural	1	.....	1	1
Wisconsin:				
Urban	1	2	1	.....
Rural	.....	2	2	1
Wyoming:				
Rural	1	.....	.....	(4)
Washington, D. C.	1	.....	2	3

1. Exclusive of Hawaii.
2. Including District of Columbia.
3. Included with cities in non-registration states.
4. Not added to registration area until a later date.
5. Includes only municipalities having from 1,000 to 10,000 population.

CHART II.—CAUSES OF DEATH

Figures in parentheses in the columns are reference numbers to footnote explanations.

AREA	NUMBER OF DEATHS FROM PELLAGRA									
	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911
SUMMARY										
The registration area1	2,322	2,806	3,741	3,666	2,390	2,843	1,550	1,015	674	659
Registration states2	2,122	2,568	3,126	2,843	1,807	1,058	847	573	326	322
Cities in registration states2	594	693	930	801	558	437	391	260	166	163
Rural part of registration states	1,528	1,875	2,196	2,042	1,249	621	456	313	160	159
Registration cities in non-Registration states	200	238	615	823	583	1,785	703	442	348	337
All registration cities2	794	931	1,545	1,624	1,141	2,222	1,094	702	514	500
REGISTRATION STATES										
California:										
Cities	5	11	16	8	14	11	14	13	4	5
Rural districts	7	12	6	16	11	17	14	6	6	7
Colorado:										
Cities	.....	2	2	2	2	.....	5	1	.....	3
Rural districts	1	1	.....	2	1	2	4	2	5	3
Connecticut:										
Cities	1	4	4	4	1	1	4	3	.....	.....
Rural districts	.....	1	.....	1	.....	.....	2	1	.....	1
Delaware:										
Cities	.....	.....	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Rural districts	.....	.....	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Florida:										
Cities	30	30	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Rural districts	84	95	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Illinois:										
Cities	3	7	8	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Rural districts	8	10	18	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Indiana:										
Cities	1	1	3	4	1	3	1	1	.....	2
Rural districts	2	4	9	2	3	6	1	3	3	1
Kansas:										
Cities	2	3	8	12	3	6	11	(3)	(3)	(3)
Rural districts	6	16	14	16	7	22	7	(4)	(4)	(4)
Kentucky										
Cities	10	17	27	37	8	14	18	16	32	19
Rural districts	55	94	120	160	116	135	131	88	84	46

AREA	NUMBER OF DEATHS FROM PELLAGRA									
	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911
REGISTRATION STATES—Con.										
South Carolina:										
Cities	102	126	273	241	257	(3)	(3)	(3)	(3)	(3)
Rural districts	204	275	468	473	472	(4)	(4)	(4)	(4)	(4)
Tennessee:										
Cities	62	95	144	153	(7)	(3)	(3)	(3)	(3)	(3)
Rural districts	240	340	532	597	(4)	(4)	(4)	(4)	(4)	(4)
Utah:										
Cities	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
Vermont:										
Cities	.....	1	1	2	.....	1	.....	.....	.....	.....
Rural districts	1	6	4	3	2	2	2	3	3	.....
Virginia:										
Cities	39	57	104	101	74	110	94	57	(3)	(3)
Rural districts	95	120	223	201	174	222	156	108	(4)	(4)
Washington:										
Cities	.....	1	.....	.....	.....	2	.....	.....	.....	.....
Rural districts	.....	.....	.....	2	.....	.....	.....	2	.....	.....
Wisconsin:										
Cities	.....	.....	1	1	1	.....	.....	2	.....	2
Rural districts	1	2	1	2	.....	1	2	3	2	3
Washington, D. C.	5	10	9	14	9	16	14	10	6	1
REGISTRATION CITIES IN NON-REGISTRATION STATES8										
Birmingham, Ala.	30	51	109	81	50	116	44	38	26	21
Mobile, Ala.	7	24	35	57	45	55	23	22	7	16
Montgomery, Ala.	32	19	37	52	37	54	38	31	33	25
Jacksonville, Fla.	(9)	(9)	17	23	22	52	15	14	16	8
Key West, Fla.	(9)	(9)	.....	.....	.....	.....	.....	1	.....	.....
Pensacola, Fla.	(9)	(9)	12	15	9	25	9	4	(4)	(4)
Tampa, Fla.	(9)	(9)	8	5	4	12	(4)	(4)	(4)	(4)
Atlanta, Ga.	38	43	93	98	80	134	110	82	66	106
Brunswick, Ga.	1	4	4	7	(4)	(4)	(4)	(4)	(4)	(4)
Augusta, Ga.	20	13	(7)	38	36	56	46	23	(4)	(4)
Savannah, Ga.	17	18	31	37	28	54	54	33	20	13
Chicago, Ill.	(9)	(9)	(9)	6	6	9	7	4	7	9
Decatur, Ill.	(9)	(9)	(9)	1	.....	.....	.....	.....	.....	1
Jacksonville, Ill.	(9)	(9)	(9)	.....	4	1	1	.....	.....	.....
Quincy, Ill.	(9)	(9)	.....	.....	.....	.....	.....	1	.....	.....
Springfield, Ill.	(9)	(9)	(9)	.....	1	.....	.....	.....	.....	.....

Louisiana:										
Cities	61	73	100	(3)	(3)	(3)	(3)	(5)	(3)	(3)
Rural districts	142	154	163	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Maine:										
Cities	.....	2	10	10	5	4	4	3	4	.....
Rural districts	4	3	6	9	10	6	5	7	1	1
Maryland:										
Cities	4	4	5	5	2	9	4	11	6	3
Rural districts	4	5	13	11	1	7	3	3	2	8
Massachusetts:										
Cities	9	7	15	10	23	16	13	8	4	1
Rural districts	2	7	6	9	17	9	6	5	1	.....
Michigan:										
Cities	4	2	7	5	3	8	2	7	2	1
Rural districts	1	2	2	1	2	4	2	1	.....	2
Minnesota:										
Cities	.....	1	2	.....	.....	.....	2	1	.....	.....
Rural districts	1	1	2	.....	2	1	3	1	.....	.....
Mississippi:										
Cities	153	126	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Rural districts	405	369	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Missouri:										
Cities	11	9	11	19	11	12	14	9	3	8
Rural districts	14	16	45	40	30	22	10	14	12	10
Montana:										
Rural districts	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Nebraska:										
Rural districts	1	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
New Hampshire:										
Cities	.....	1	2	3	8	2	9	1	.....	.....
Rural districts	1	1	.....	2	3	3	1	1	1	.....
New Jersey:										
Cities	1	3	2	1	3	3	4	2	1	1
Rural districts	.....	1	.....	1	1	2	1	.....	1	1
New York:										
Cities	8	13	18	28	22	8	12	5	2	1
Rural districts	4	8	3	1	6	4	2	2	.....	1
North Carolina:										
Cities	76	77	143	128	97	195	147	96	93	105
Rural districts	242	323	553	492	388	5 152	5 101	6 61	6 36	6 72
Ohio:										
Cities	2	2	3	2	4	2	1	.....	.....	.....
Rural districts	1	6	4	1	1	3	.....	.....	2	2
Oregon:										
Cities	.....	.....	1	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Rural districts	.....	.....	1	(4)	(3)	(4)	(4)	(4)	(4)	(4)
Pennsylvania:										
Cities	2	3	4	5	2	5	5	5	.....	4
Rural districts	2	3	3	.....	2	1	1	2	1	1
Rhode Island:										
Cities	3	4	7	6	8	9	13	9	9	7
Rural districts	.....	.....	.....	.....	.....	.....	1	.....	.....	.....

Coffeyville, Kans.	(9)	(9)	(9)	(9)	(9)	(9)	(9)	1	.....	(4)
Kansas City, Kans.	(9)	(9)	(9)	(9)	(9)	(9)	(9)	.....	1	.....
Parsons, Kans.	(9)	(9)	(9)	(9)	(9)	(9)	(9)	.....	1	(4)
Topeka, Kans.	(9)	(9)	(9)	(9)	(9)	(9)	(9)	2	1	(4)
Wichita, Kans.	(9)	(9)	(9)	(9)	(9)	(9)	(9)	3	.....	.....
Alexandria, La.	(9)	(9)	(9)	5	(4)	(4)	(4)	(4)	(4)	(4)
Baton Rouge, La.	(9)	(9)	(9)	8	(4)	(4)	(4)	(4)	(4)	(4)
Lake Charles, La.	(9)	(9)	(9)	1	(4)	(4)	(4)	(4)	(4)	(4)
Monroe, La.	(9)	(9)	(9)	5	(4)	(4)	(4)	(4)	(4)	(4)
New Orleans, La.	(9)	(9)	(9)	50	46	76	67	53	23	23
Shreveport, La.	(9)	(9)	(9)	28	(4)	(4)	(4)	(4)	(4)	(4)
Hattiesburg, Miss.	(9)	(9)	6	8	14	36	(4)	(4)	(4)	(4)
Jackson, Miss.	(9)	(9)	82	108	90	122	(4)	(4)	(4)	(4)
Meridian, Miss.	(9)	(9)	43	59	19	62	(4)	(4)	(4)	(4)
Natchez, Miss.	(9)	(9)	9	16	17	18	(4)	(4)	(4)	(4)
Vicksburg, Miss.	(9)	(9)	15	25	14	52	(4)	(4)	(4)	(4)
Lincoln, Nebr.	(9)	.....	1	.....	1	.....	.....	.....	.....	.....
Omaha, Nebr.	(9)	.....	1	.....	.....	.....	.....	.....	.....	.....
Portland, Oreg.	(9)	(9)	(9)	.....	.....	1	1	.....	.....	.....
Oklahoma City, Okla.	5	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Charleston, S. C.	(9)	(9)	(9)	(9)	(9)	139	85	56	49	30
Columbia, S. C.	(9)	(9)	(9)	(9)	(9)	384	(4)	(4)	(4)	(4)
Greenville, S. C.	(9)	(9)	(9)	(9)	(9)	31	(4)	(4)	(4)	(4)
Spartanburg, S. C.	(9)	(9)	(9)	(9)	(9)	19	(4)	(4)	(4)	(4)
Chattanooga, Tenn.	(9)	(9)	(9)	(9)	(7)	52	21	(4)	(4)	(4)
Jackson, Tenn.	(9)	(9)	(9)	(9)	(7)	7	9	(4)	(4)	(4)
Knoxville, Tenn.	(9)	(9)	(9)	(9)	(7)	33	16	(7)	7	12
Memphis, Tenn.	(9)	(9)	(9)	(9)	(7)	104	107	37	26	13
Nashville, Tenn.	(9)	(9)	(9)	(9)	(7)	35	21	20	7	12
Beaumont, Tex.	6	4	7	7	5	(4)	(4)	(4)	(4)	(4)
Cleburne, Tex.	(7)	3	3	2	(4)	(4)	(4)	(4)	(4)	(4)
Dallas, Tex.	18	19	36	24	30	(4)	(4)	(4)	(4)	(4)
El Paso, Tex.	1	2	5	11	1	4	3	.....	.....	1
Galveston, Tex.	3	6	7	3	8	11	9	4	6	6
Houston, Tex.	10	21	25	25	(4)	(4)	(4)	(4)	(4)	(4)
San Antonio, Tex.	12	11	29	18	16	31	17	13	4	.....
Alexandria, Va.	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	1	.....
Danville, Va.	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	10	4
Lynchburg, Va.	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	6	3
Norfolk, Va.	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	11	5
Petersburg, Va.	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	5	3
Richmond, Va.	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	12	12
Roanoke, Va.	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	3	2

(1) Exclusive of Hawaii.
(2) Including the District of Columbia.
(3) Included with cities in non-registration states.
(4) Not added to registration area until a later date.
(5) Includes only municipalities having from 1,000 to 10,000 population in 1910.
(6) Includes only municipalities having from 1,000 to 10,000 population in 1910.
(7) Transcripts for deaths not received.
(8) Includes cities which were in non-registration states for at least one year of the series shown.
(9) Included with cities in registration states.

1916—*Rice: Age 4-12 years, 147 cases; 10-14 years, 35; orphanages, some included in Babcock's report, 1909; South Carolina.
1916—Burr and Cadwalader: Age 10-14 years, 1; female, 1; private; race, white; died.
1917—Foote: Age 10-14 years, 1; institution; District of Columbia.
1917—Murphy: Age 7 months to 1 year, 2; New York.
1917—Jobling and Petersen: A large per cent of 930 cases studied; Tennessee.
1918—Snyder: Age 1-4 years, 2; 4-7 years, 1; 7-10 years, 1; 10-14 years, 1; private; 5 cases in one family; Alabama.
1920—Voegtlen: Age 5 months, 1; female, 1; private; race, white; South Carolina.
1921—Strong: One case; institution; race, black; Louisiana.
1922—Lustberg and Birchet: Age 7 months to 1 year, 3.
1924—Moss, V. & R.: Age 1-4 years, 1; 4-7 years, 1; 7-10 years, 1; 10-14 years, 1; male, 3; female, 1; private; Mississippi.
1924—Goldberger: Age 1-4 years, 16; 7-10 years, 35; 10-14 years, 9; male, 28; female, 32; race, white (?); Kentucky.
1926—Bloom: Age 1-4 years, 3; male, 2; female, 1; private; Louisiana and Mississippi.
1926—Bloom: 4.5 per cent of total cases; age 4-7 years, 7; 10-14 years, 6; male, 6; female, 7; Shreveport Charity Hospital; race, 1 white, 12 black; Louisiana.
1926—Bloom: Age 4-7 years, 22; 7-10 years, 43; Charity Hospital, New Orleans, La.; race, white; death rate, 4.6 per cent; Louisiana, Alabama, Arkansas, Mississippi and Texas.
1926—Bloom: Age 4-7 years, 26; 7-10 years, 41; Charity Hospital, New Orleans, La.; race, white; death rate, 23.7 per cent; Louisiana, Alabama, Arkansas, Mississippi and Texas.

*New cases in new-comers, 67 cases; new cases in old residents, 86 cases. Recurrences, 163 cases.

CHART VI

STATISTICS OF SHREVEPORT CHARITY HOSPITAL

Pellagra Cases Treated, 1923 through June 1926

	1923	1924	1925	1926 *	Total
RECOVERED					
White:					
Male	7	8	9	3	27
Female	5	5	9	3	22
Colored:					
Male	6	10	12	4	32
Female	25	30	41	23	119
DIED					
White:					
Male	1	2	3		6
Female	2	2	2	1	7
Colored:					
Male	1	1	6	8	16
Female	5	12	33	7	57
Total	52	70	115	49	286

*Six months.

NUMBER OF CHILDREN UNDER 14 YEARS

	White	Colored
Recovered:		
4-10 years	0	5
11-14 years	1	1
Died:		
4-10 years	0	2
11-14 years	0	4
Total recovered	7	0
Total died	0	6

Total number of children cases, 13; per cent of children cases, 4.53; 1 Caucasian; 12 were negroes; 6 males and 7 females; youngest case 4 years of age; fatal cases, 4.5 per cent.

STATISTICS OF CASES REPORTED IN CHILDREN (U. S. A.)

The total number of pellagra cases in infancy and childhood that I have been able to collect from all available sources total 1,589 collected cases, exclusive of state reports. The age limits were 2 months to 15 years. Roughly estimated, omitting cases reported by two authorities, plus those that may have escaped my attention, about 2,000 would conservatively express a more

CHART VII

CHARITY HOSPITAL, NEW ORLEANS, LA.
From 1909 through 1925

Total adults	1,137
Total children	147
Total cases	1,284

Cases from Louisiana, Alabama, Mississippi, Arkansas and Texas

	Number of Cases
1909	2
1910	5
1911	18
1912	6
1913	12
1914	21
1915	21
1916	10
1917	31
1918	12
1919	2
1920	1
1921	1
1922	1
1923	1
1924	2
1925	1
	147

Note: Of this number there were a few readmittances.

	0 to 2 years	3 to 6 years	7 to 14 years	Total
WHITE				
Male	1	9	25	35
Female	1	11	18	30
Cured		9	10	19
Improved	2	7	30	39
Unimproved		2	2	4
Died		2	1	3
COLORED				
Male		16	21	37
Female	1	9	20	30
Cured		3	7	10
Improved	1	15	22	38
Unimproved		2	1	3
Died		5	11	16

Some definite ages not given.
Death Rate—White, 4.6 per cent; colored, 23.7.
Average death rate, 14.1 per cent.

accurate figure. And still this disease is seldom met in early life (*Chart V*).

My series composes one hundred and sixty-three cases, three private, one hundred and forty-seven from the Charity Hospital, New Orleans, La., and thirteen cases from the Shreveport Charity Hospital. Most of the cases at the Charity Hospital, New Orleans, La., were studied by me in the institution.

The charts are self-explanatory (*Charts VI and VII*). Note, however, that the cases reported from the Charity Hospital, Shreveport, La., date back to 1923.

STATISTICS OF THE UNITED STATES OF AMERICA

A careful and intensive study of the government statistics reveals the following:

(1) Ten states alone are reporting cases.

(2) All these states but one, until recently, did not make pellagra legally a reportable disease.

(3) If the reports of the morbidity and the number of deaths are accurate, the per cent of deaths is high (*Charts I, II and III*).

(4) If the report of the morbidity is inaccurate, and the report of the death rate is accepted, there are still many remaining states that are not complying with federal regulations, or else there is failure on the part of the physicians to diagnose pellagra, or both. In this case the percentage of the ratio of deaths to the total number of cases will be greatly reduced.

(5) The registration area from which source the death rates are computed comprises thirty-four states and the District of Columbia. The number of deaths from the missing states must be added to the number of deaths in the report so that the completed death rate will be known.

(6) Deaths from pellagra in children are still being reported from the registration area, and while the numbers do not stand out in bold figures, they must seriously be considered in discussing infantile pellagra.

PEDIATRIC TEXTBOOKS

Number of books reviewed from 1905 to 1906	95
Number of books reviewed from 1906 to November 1926	73
Total	168
Number of books mentioning pellagra	22
Number of books giving a rather detailed description of pellagra (Abt, Griffith and Holt)	3

In reviewing the many textbooks published in this country and the leading works edited in Great Britain and France, the writer finds practically no mention of pellagra prior to 1906. No reference to the disease could be found in the following:

1805—Baumes, P. M.
1829—Brichteau, T., and Charpentier, D.
1832—Dewees, W. P.
1833—Eberle, J.
1836—Dewees, W. P.
1837—Billard, C. M.
1838—Dewees, W. P.; Evanson, R. T.; and Maunsell, H.
1839—Billard, C. M., and Eberle, J.
1842—Barrier, F., and Berton, E. A. J.
1843—Barthez, E.
1844—Condie, Francis.
1845—Bouchut, E.
1846—Stewart, Jas., and Underwood, M.
1847—Evanston, R. T.
1849—Beck, John B.
1850—Condie, D. Francis, and West, Charles.
1853—Barthez, E.; Condie, D. F.; and Hartmann, Fr.
1854—Rilliett, F., and Barthez, E.
1855—Bouchut, E.
1856—Bedford, G. S., and Churchill, F.
1858—Condie, F., and Meigs, J. F.
1861—Barrier, F.
1863—Bryant, Thos.
1866—Tanner, T. H.
1868—Hiller, Thos.
1869—Ellis, Edw., and Scudder, J. M.
1870—Smith, Eustace.
1871—Combe, A.; Tanner, T. H.; and Vogel, A.
1874—Meigs, J. F., and West, Charles.
1876—Smith, J. L.
1877—Meigs, J. F.
1879—Ellis, Edw.
1880—Sozinsky, Thos. S.
1881—Anderson, E. G.; Busey, S. C.; Jacobi, A.; Meigs, J. F.; Day, W. H.; and Smith, J. L.
1882—Henoch, Edw.
1883—Goodwin, Chas. H.
1884—Smith, Eustace.
1885—Smith, Eustace.
1886—Starr, L.
1887—Jacobi, A.
1888—Starr, L.
1889—Cheadle, U. B.; Goodhart, J. F. (ed. by L. Starr); and Keating, J. M.
1890—Keating, J. M., and Vogel, Alfred.
1892—Rhodes, C. A.
1893—Ashby, H.; Wright, G. A.; and Keating, J. M.
1894—Starr, Louis.
1895—Sachs, Bernard.
1896—Kelly, S. W., and Smith, J. Lewis.
1897—Fox, G. H.
1898—Ausset; Holt, L. E.; Jacobi, A.; Taylor, M.; and Wells, W. H.
1899—Tuttle, Geo. M.
1900—Oppenheim, N.; Smith, E., and Shuttleworth; Williams, D. (ed. by Churchill, F. S.).
1902—Koplick, H. (Prac. Med. Series: Pediatrics).
1903—Jacobi, A., and Rotch, T. M.
1904—Filatov, N. F.
1905—Graetzer and Sheffield, H. B.; Rachford, B. K.; Ruhrah, John; and Sachs, Bernard.

From 1906 to the present time, mention of pellagra could not be found in the index of the texts included below:

1906—Carr, W. L.; Cotton, A. C.; Fischer, Louis; Fruhwald, F.; Graetzer, E.; Rotch, T. M.; Zahorsky, John; Pract. Med. Series.
1907—Adamson, H. G.; Kerley, C. G.; Kerr, LeG.; Saunders Medical Atlas; Pract. Med. Ser. (Ped.); Wachenheim, F. L.
1908—Pfaundler, M., and Schlossman, A.; Ruhrah, J.; Pract. Med. Series (Ped.).
1909—Chapin, H. D.; Chapin, H. D., and Pisek, G. R.; Forsyth, David; Jacobi, A. (ed. by Dr. W. M. J. Robinson).
1910—Comby, Jules; Fischer, Louis; Fordyce, A. D.; Kerr, LeG.; Rotch, T. M.; Shuttleworth, G. E., and Potts, W. A.; Still, G. F.
1911—Chapin, H. D., and Pisek, G. R.; Kerley, C. G.; Ruhrah, J.
1912—Cautley, E.; Cornell, W. S.; Holmes, A.; Pfaundler, M., and Schlossmann, A.; Still, G. F.; Zahorsky, John; Prac. Med. Ser.
1913—Garrod, A. E. (ed. by Batten, F. E., and Thursfield, H.); Hartson, G. M.; Hutchinson, Robt.; Morse, J. L.; Pract. Med. Series (Ped.).
1914—Cammidge, P. J.; Jacoby, Geo. W.; v. Reuss, A.
1915—
1916—Graham, E. E.; Schulz, F. W. (trans. by Bork, W.); Sheffield, H. B.; Shuttleworth and Potts.
1917—Freeman, R. G.; Tuttle, G. M., and Hurford, P. G.
1918—Koplek, Henry; Pract. Med. Series (Ped.).
1919—Modern Clinical Medicine; Pract. Med. Series (Ped.).
1920—Evans, E.; Morse, J. L.; Still, G. F.
1921—
1922—Feer (Sedwick, J. P., and Scheerer, C. H.; Fischer, Louis; Gruelle, C. G.; Hess, Julius; Holt, L. E.
1923—Bell, A. J.; Emerson, W. R. P.; Myers, B.; Morse, Wyman and Hill.

1924—Shaw, H. L. K.; Levinson, A.
1925—Goodhart, J. F. (Still, G. F., ed.); Hess, Julius.
1926—Morse, J. L.

During the years 1906-1926 pellagra was found to be briefly mentioned in the following:

1909—Tuley, H. E.: pp. 236-38, speaks generally; no cases given.
1911—Schamberg, J. F.: (Skin), discusses briefly the skin manifestations of pellagra, with no personal pediatric cases.
1912—Roberts, S. R.: pp. 38-9, youngest cases, infants 4-5 months, which are included in special table.
Wood, E. J.: p. 120, youngest patient 22 months; occurrence in infancy and childhood apparently unusual; saw one fatal case in negro girl of 11 years. (See special table.)
1913—
1914—McKee, J. H., and Wells, W. H.: Vol. II, p. 913, mentions.
Ruhrah, J.: pp. 473-75, mentions.
1915—
1916—Niles, G. M.: p. 965, reports infant born of pellagrous mother; lived two months. No cases under 5 personally known; few under 10.
Practical Medical Series (Pediatrics), p. 134.
1917—Dunn, C. H.: Vol. II, p. 97.
Fisher, Louis: p. 255.
Schamberg, J. F.: p. 45, states "most patients are between 20 and 50 years of age.'
1918—Stelwagon, Henry W.: pp. 181-82, speaks generally, stating developments at almost all ages, most frequently in those of matured adult age; greatest frequency among children 2 to 10 and adults 20 to 40.
1919—Griffith, J. P. Crozer: pp. 643-47, Vol. I, states in part: "Several cases in Philadelphia have come under my observation, two of them in children who had never been beyond the borders of Pennsylvania. Pellagra attacks all ages, although it seems most common in young adults. Studies . . . show that it may occur even as early as two months of life, and that it is rather frequent between the ages of six and eighteen months. . . . "
Harris, H. F.: Nothing pertinent given.
Kerley, C. G.: pp. 738-39, states: "Most of the patients are between the ages of 20 and 40 years and only about 9 per cent are under the age of 15 years. Cases observed in infants have never been proved in any degree hereditary. Mental derangement is common, but this symptom in children calls for only passing mention. In children pellagra is ordinarily less severe than in adults."
1920—Dunn, C. H.: p. 97, mentioned.
Hess, A. F.: (Scurvy), p. 251, speaks comparatively of.
Holt, L. E., and Howland, J.: pp. 1158-61 (see 1923).
1921—Sheffield, H. B.: p. 517, briefly mentions.
1922—Porter, Langley, and Carter, Wm. E.: pp. 349-50, state disease is rare during infancy, although an increasing number of cases is being reported; no individual cases.
1923—Holt, L. T., and Howland, John: pp. 1111-14, states disease is comparatively rare in very young infants; much more common after two years of age.
1924—Abt, I. E.: Splendidly written article by Dr. J. Ross Snyder giving most complete resume of pellagra yet published in American textbook; on pp. 876 through 906, Vol. II.
Kerley, C. G.: p. 787, mentions nothing of particular interest.
1925—Chapin, H. D., and Royster, L. T.: p. 451, nothing of note.
Fischer, Louis: pp. 279-80, states that in a study of orphanage, Jackson, Miss., of 211 cases, 68, or 32 per cent, had pellagra; practically all cases were children between ages of 6 and 12 years (Waring).

GENERAL CONSIDERATIONS

Age.—The infrequency of pellagra in infancy and childhood is without proof or substantiation. While the number of cases under six months of age is few, there is a greater frequency in childhood between two and ten years of age. The youngest case in this country to be reported was two months. Lavinder said "pellagra has been seen in the infant at the breast;" Snyder remarks "that scant attention has been given to children;" Weston in 1914 stated:

"From the pediatric point of view, pellagra is a subject of most absorbing interest. Until two years ago I do not recall having seen the disease in early childhood, but as soon as I began giving the question attention and looking for the disease, the cases were found and they seem to increase more rapidly as time goes on."

The Thompson-McFadden Pellagra Commission, in its Second Progress Report, says:

"In children under the age of two years we have record of only one case in Spartanburg County, a negro male, recorded as a pellagrin before he was two years old.

"The figures are not very large, but they are large enough to indicate clearly that pellagra tended to attack children after their second year. . . .

"In children the disease first became important after the age of two."

Table 7 gave the number of pellagrins in seven mill-villages in each year of life up to the twentieth, age at first erythema. This table gives one male in the first year, and one male in the second year.

"Children under two years of age were practically free from the disease, and yet from the age of two to ten years children showed an excessive amount of pellagra. Congenital pellagra evidently did not occur in this study.

"The high incidence rate of pellagra in children seems to deserve special emphasis because it has not been generally recognized. Many of these cases have been mild, and would not ordinarily be brought to the attention of physicians.

"Pellagra was absent or very rare in children under two years of age"

The question of congenital pellagra is too recent in this country for its hereditary tendencies to become known. However, it is almost an accepted fact in Europe that there is a profound tendency for this disease to be transmitted from parent to offspring. "A full generation will be required following its endemic appearance before such influences can attain their maximum development in the United States." Approximately 10 per cent of the cases are under the age of fifteen years, though my study averages 4.5 per cent from the Shreveport Charity Hospital, and 11.4 per cent in the Charity Hospital of New Orleans. As an additional example, Grimm found 15 per cent in three hundred twenty-three cases which he studied. The number of deaths in childhood from this disease is calculated at about 15 per cent of the total children's cases, and about 3 per cent per 100,000 from the registration area, and perhaps somewhat higher if all statistics were available.

This gives one a working idea of the total number of child cases in this country. Therefore, the limited number of infantile pellagra cases is due more to a failure of diagnosis than an absence of this disease in pre-pubescent life.

Sex.—In children the sexes seem equally susceptible, though around the pubescent period there is a slight predominance of the female. As females and children spend more of their time about the house than the adult male, this fact has been used to substantiate the belief that pellagra is a "place" infection.

Race.—Race is not particularly a factor of importance. In America the negro is afflicted with the disease, at times in certain foci in greater number than the white, and still the negro is apparently immune in Egypt and elsewhere. Jews do not develop the disease. Recently the disease has been reported in China.

Contagion and Immunity.—In certain sections of the United States, since the onset of pellagra, steps have been taken for the establishment of means for segregation and quarantine, though this move has not been under federal patronage. This question would naturally include the discussion of the many causes of the disease and would necessarily warrant a biased opinion's being given at this time. This is one of the subjects to be dealt with in another paper. Hence the discussion is limited.

Lavinder has said "If it is communicable at all, pellagra certainly does not seem to be so in any very direct way from one individual to another."

REGARDING INCIDENCE

(1) Indoor life in the United States is more responsible for pellagra than outdoor life.

(2) Rural districts show more pellagra than cities, though the banker's child may have pellagra as quickly as the farmer's field child.

(3) Institutions, such as insane asylums, orphanages and penitentiaries, have proven foci for a large number of cases, though but few of the executive, medical or nursing staffs or menial helpers have ever developed a case within the confines of these institutions.

SYMPTOMS

The symptoms are generally classified under three systems, and today the writer is asking you to consider a fourth: (1) alimentary, (2) skin, (3) nervous and (4) osseous. Under the alimentary system the following component parts are considered: (a) tongue, (b) gums, (c) teeth, (d) buccal mucosa, (e) palate, (f) pharynx, (g) esophagus, (h) stomach and intestines, (i) tissue changes.

(1) *Alimentary Tract in Pellagra.*—For the sake of brevity only the symptoms of the tongue, gums, stomach and intestines will be discussed.

Tongue.—For a long time prior to a positive diagnosis the tongue seems to be involved. There is a redness like that which precedes scarlet fever, smooth and clean; the second type is a geographical tongue, and in the third type the fungiform papillae seem pediculated. The dorsal surface is cracked and occasionally there are deep rhagades. When the patient's tongue is extended there is a tremor; that is most significant in pellagra. Is there any relation in some cases of the geographical tongue and pellagra?

Gums.—In most of the cases, especially where an early diagnosis is made, the gums are anginal like the tongue and bleed readily. In the later stage the contrast is seen, extremely pale gums with retraction.

The Stomach and Intestines.—The symptoms of the gastro-intestinal tract are the most constant. Even before the diarrhea is noted, the child suffers from flatulence, and there is a desire to belch at all times. A dilated stomach with an associated protrusion of the abdomen is also observed. This distention is a common manifestation, and though the child may defecate twenty times or more daily, the symptom still persists. The blood vessels of the abdomen are visible and in certain types of pellagra apparently engorged. There are cases presenting most of the classical symptoms of pellagra, with periodic attacks of diarrhea, not of the serious type, where a diagnosis of pellagra is often withheld. Foreign students believe that *pellagra sine pellagra* does exist, and I may be in error in substantiating this thought. Nevertheless, I do believe that pellagra does exist without the classical dermatological symptoms in sporadic cases and in mild endemics.

(2) *Skin Manifestation in Pellagra*—The (a) character, (b) pellagrous skin, (c) classification, (d) location, (e)relation to light and (f) sensory disturbances are included. The classification, location and relation to light only will be taken up at this time. Majocchi's classification is more acceptable to me and is as follows:

(1) Pellagrodermata: (a) common, (b) erysipeloid, (c) erythemato-papulous, and (d) erythemato-macular.

(2) Hemorrhagic pellagroderma.

(3) Pemphigoid pellagroderma.

(4) Seborrheic, keratosic and acneic pellagroderma.

In the course of the disease of the common type three stages are distinguished: (a) hyperemic, (b) deskuamative and (c) cracked. At first the skin in certain regions, exposed surfaces, alone become hyperemic. This is the seat of the intense pruritis and of burning. The color varies from a rose to a livid or dark red. There are various gradations on the same regions and in the same subject according to the degree of the process. The distribution is symmetrical, more frequently on the back of the hands, of the feet (gloves and boots), on the neck (ribbon and collar), on the superior third of the sternum, where sometimes the appearance is one of a triangle. On the face appearing as bands very distinct at times on the forehead. In other cases at the dorsum and the lateral parts of the nose in the form of a butterfly, with the wings spread out. These expressions are pathognomanic of pellagra. In infants, especially at the onset, one sees dark circumscribed areas distributed in the parts mentioned and later on appearing as circumscribed scabs. The desquamation appears in the latter part of the first period of the disease, occurring in the spring at first and reoccurring in the fall. During this interval, lasting from twelve to thirty-five days, there is prostration, weariness, sense of tension and of formication and of intense pruritis. The cracked or third stage of the common type of skin manifestation is uncommon in children. These cutaneous expressions of infantile pellagra repeat themselves from year to year.

(4) *Osseous System in Pellagra.*—In my review of literature covering foreign and English textbooks, articles and case reports, the association of his system with pellagra has not been mentioned. There has come to my attention many different expressions of bone and joint involvement. The following notations may be of interest to the profession. A large per cent of pellagrus children complain of symptoms pertinent to joints and long bones, varying in degree from pain elicited upon simple manipulation to a type of arthritis that may be diagnosed as Still's disease. Dactylitis has been observed in three cases; rather unusual, as in the past we were prone to consider tuberculosis and syphilis as sole causes of this entity.

DISCUSSION (*Abstract*)

Dr. William Weston, Columbia, S. C.—Pellagra is unquestionably constantly being seen. I do not suppose there is a month of the year that I do not see at least one or two cases, but I believe it is becoming very much milder. We see children up and about apparently feeling well, but with the pathognomonic dermatological symptoms.

Goldberger claims to have discovered the vitamin the absence of which causes this disease.

At times undoubtedly pellagra is confused with acrodynia and vice versa. Two or three points should distinguish the condition. In acrodynia there is a marked erythema on the palms and soles with intense burning and itching. The rash may also be on the dorsal surfaces. It appears with greater intensity at the tips of the fingers or at the ends of the toes, and it gradually fades as it extends up the arm or leg. With pellagra the rash is definitely and sharply defined. With acrodynia there are lacrimation and distressing photophobia, which are not seen in pellagra. In acrodynia there is repeated desquamation and periodic sweats which are not usual in pellagra.

Dr. J. Ross Snyder, Birmingham, Ala.—There is a definite tendency among physicians to believe that pellagra is on the decrease. If we keep our eyes open we shall continue to observe the less striking symptoms of pellagra. Probably enough educational work has been done in the South to relieve a proportion of our population from this disease. We should, with continued study of the disease, look not for the pronounced eruption but for some of the less definite symptoms, as Dr. Bloom has pointed out.

Dr. D. Lesesne Smith, Spartanburg, S. C.—Looking up the statistics of the charity service for this past summer, I found that we had ten cases of pellagra. Three were in nursing children, and the mothers of the three nursing children all had pellagra. Last week one of those children died in this charity service. The mother is now in the asylum as the result of pellagra. The most striking symptom, I think, in children, the earliest manifestation, is the nervous manifestation. Then we see diarrhea and sore mouth, the rash appearing last in the order of general symptoms in these infants. I think the rash is typical. It occurs most often on the neck, forehead, and in the pubic region, not on the hands and feet, as in the adult.

Pellagra is more common in infants than we think. Most of these cases go to the grave undiagnosed as pellagra but diagnosed as diarrhea, because the children do not live long enough for the rash to appear.

Dr. R. L. Miller, Waynesboro, Ga.—I have recently had occasion to look up the gastric analyses in cases of pellagra before and after the incidence of the disease, and in all of these cases I found either a total absence of free hydrochloric acid or a very marked deficiency. We know that in pellagra we have an absence of amino acid, and this fact coupled with the deficiency of free hydrochloric acid in the gastric contents has led me to two questions: first, is this absence of the amino acid a result of the want of the necessary amount of hydrochloric acid, and secondly, is this condition a result of the disease or an etiological factor in the production of the disease?

I believe that pellagra is a nutritional disease, but that this deficiency of free hydrochloric acid has something to do with the incidence of the disease. Every case of pellagra that I put on large doses of hydrochloric acid to be taken during the meal, not before or after, has shown great improvement. All of these cases have been in adults, but we can reason by analogy, and what would be applicable to an adult would be applicable to a child. In a few cases there is an in-

creased acidity, but there may be the exceptions that prove the rule.

Dr. Bloom (*closing*).—I did not attempt in my paper to discuss the differential diagnosis of pellagra and acrodynia. The skin manifestations I did not discuss. They are many, but the more common form is of the type first expressed by erythema, then passing through a desquamative stage, and sometimes assuming a scaly state.

I have made no experimental observations on the subject of deficiency of hydrochloric acid; but to all my cases of children with pellagra I give hydrochloric acid. Hydrochloric acid tends to increase peristaltic movements in normal children; but in pellagrous children, where peristaltic movements are increased, it seems to decrease them.

The pain elicited upon moving the joint is like that elicited in congenital syphilis. That is one type. Another type is similar to Still's disease. One of mine I might have diagnosed Still's disease, except for the typical butterfly eruption of the face, the dorsum of the butterfly being on the nose and the wings on the cheeks. Where you have that, you have pellagra. It is significant that in one of these cases the diagnosis was made by the radiologist, who did not know that the original diagnosis was pellagra.

THE ETIOLOGY OF PERNICIOUS ANEMIA: IS IT SECONDARY TO HEPATIC INFECTION, RESULTING IN DEFICIENCY OF A LIVER ENDOCRIN (ANTIHEMOLYSIN)?*

By SEALE HARRIS, M.D.,
Birmingham, Ala.

The control of pernicious anemia by the addition of liver to the patient's diet[1] or by the use of a liver extract[2] or "fraction"[3] resembles very closely the control of diabetes, or hypoinsulinism, by the use of insulin. In diabetes the most frequent cause of the hyposecretion of insulin is a previous, usually unrecognized, pancreatitis which has destroyed many, or all, the cells of the islands of Langerhans, so might not a hepatitis destroy or disturb the functions of a sufficient number of liver cells which stabilize red blood cell destruction to produce the type of oligocythemia known as pernicious anemia? In other words, may not the essential etiological factor in pernicious anemia be primarily a hypofunction of liver cells which secrete an endocrin that controls erythrocytolysis?

The theory that pernicious anemia may follow, or be a sequel of, a hepatitis seems borne out by the fact that autopsies on pernicious anemia patients have shown hyaline and other degenerative changes in the liver in nearly all cases.[4] Cornell in his excellent new book on Pernicious Anemia,[5] published by the Duke University Press, mentions the fact that in 1869 Perroud[6] advanced the theory of fatty degeneration of the liver as the etiological factor in pernicious anemia. He thought that the anemia, cachexia and edema resulted from the liver pathology. Demonstrable pathologic lesions are constant findings in the livers of patients having proven pernicious anemia. Studies are not complete enough as yet to identify any of the particular liver lesions as the *sine qua non* of pernicious anemia causation, but the frequency of such a relationship is suggestive.

INFECTIOUS THEORIES

Many efforts have been made to account for pernicious anemia by a specific organism. In 1887, Hunter[7] propounded the theory that a toxin, elaborated by some specific organism within the lumen of the intestine, was absorbed, and by its direct action produced hemolysis of the erythrocytes in the portal venous system. The conception expressed in this present article is in accord with Hunter's viewpoint as to the possible portal of entry, but disagrees concerning the specificity of the causative organism and the modus operandi. Christian Herter,[8] in 1906, found an increase in *B. welchii* in the stools of pernicious anemia patients and suspected it of being the specific organism of the disease. Later Kahn and Torry[9] injected into monkeys toxins prepared from *B. welchii* cultures and produced in the main anemia resembling the pernicious anemia type. Other observers have made investigations to prove the *B. welchii* origin of pernicious anemia, but have been unable to produce evidence that it is the specific organism causing the disease.

A recent attempt to prove the specificity of origin of pernicious anemia was made by Wood,[10] who, recognizing the similarity of symptoms and laboratory findings of pernicious anemia to those found in sprue, and working on Ashford's hypothesis that the latter is due to a yeast fungus, the Monilia psilosis, [11] found that organism constantly present in the mouths and feces of pernicious anemia patients. Wood prepared cultures of the Monilia psilosis obtained from pernicious anemia cases and feeding them to guinea pigs produced in them a hemolytic blood picture and bone marrow changes similar to those found in pernicious anemia. Wood produced a milder de-

*Chairman's Address, Section on Gastro-Enterology, Southern Medical Association, Twenty-first Annual Meeting, Memphis, Tennessee, November 14-17, 1927.

gree of anemia in guinea pigs by injecting intravenously a filtrate of the monilia cultures. Wood's researches suggest that the Monilia psilosis may be one of the pathogenic organisms that can produce pernicious anemia.

THE RELATIONSHIP OF SPRUE AND PELLAGRA TO PERNICIOUS ANEMIA

Pathological changes in the pancreas have been found almost constantly in sprue,[12] and since liver pathology is a concomitant finding in pernicious anemia, it seems possible that the monilia localizing in the pancreas with a resultant pancreatitis may be an etiological factor in sprue. When it localizes in the liver, pernicious anemia may result. I would not be understood, however, as asserting that the Monilia psilosis is the specific organism that produces the pancreatitis associated with sprue any more than I would assert that the same organism is the only cause of the hepatic abnormality that is usually found in pernicious anemia. Indeed, it seems likely that other and perhaps many pathogenic organisms may be factors in the etiology of both sprue and pernicious anemia.

Wood also called attention to a similarity of the blood picture in severe cases of pellagra to that of pernicious anemia. We have had the opportunity of observing the transition of one typical case of pellagra into true pernicious anemia, a report of which follows:

R. M. E., male, white, age 40, came under our observation in 1916. U. C. had the glossitis, diarrhea and parchment-like skin on the posterior surfaces of his hands so characteristic of pellagra. His blood count at that time was 38,000 red cells per cu. mm. of blood, but he had the achlorhydria which, according to Clarence Johnson, is found in 90 per cent of cases of pellagra and which occurs in all cases of pernicious anemia. He was placed on a liberal diet of milk, eggs, meat, green vegetables and fruits and given 6 c.c. or 90 minims of dilute hydrochloric acid in milk with meals and three hours after meals. The glossitis, diarrhea and dermatitis were soon relieved and he enjoyed good health for several years, though he had occasional attacks of diarrhea. Repeated examinations of his stomach contents after the Ewald test breakfast always showed an absence of hydrochloric acid, except for brief periods during the past eleven years. He observed that when he left off the acid he developed diarrhea, which subsided when he began using it again.

In 1921 this patient complained of weakness, and his skin showed the typical lemon yellow tint of pernicious anemia. His red blood count then was 1,200,000. Later it went as low as 900,000. He had been eating liberally of eggs, milk, meat, vegetables and fruits, a diet rich in proteins and vitamins, yet he developed pernicious anemia. He had remissions of symptoms of pernicious anemia, when his blood count would go up as high as 2,500,000, but each exacerbation lowered his vitality. He was given blood transfusions, twenty-one in all, which caused some improvement at times, until finally he failed to improve after them. In June of 1926 liver was added to his diet and in a month his red blood count had risen to 4,500,000 and he regained his strength. He has kept up the liver diet and has been in excellent health since.

The development of a case of typical pellagra into a case of typical pernicious anemia suggests that both had the same etiology. It seems certain that dysfunction of the liver in this case was the essential etiological factor of the pernicious anemia, because the ingested calf's liver supplied the substance that was responsible for an increase in red blood cells from around 1,000,000 to 4,500,000. The achlorhydria did not seem to be an important factor in this case, because he had taken large doses of dilute hydrochloric acid both before and after he developed pernicious anemia without any effect on his red blood count.

GALL BLADDER INFECTIONS AND PERNICIOUS ANEMIA

Jones and Joyce[13] observed the association of gall bladder infections with pernicious anemia in a number of patients, in whom improvement of the anemia followed cholecystectomy.

In a case of what they called "border line" anemia in which cholecystectomy was performed, there were evidences of hepatic changes and a piece of liver was excised for examination. The pathologist's report was as follows: "Chronic interstitial cholecystitis with fibrosis, scarring and lymphoid infiltration. Fatty or parenchymatous degeneration of marked degree of the liver; chronic interstitial hepatitis." That the same organism was responsible for the gall bladder infection and the hepatitis in this case is shown by the fact that "cultures from the gall bladder and liver gave *Staphylococcus albus* in each." In this case symptomatic recovery followed cholecystectomy "but a moderate type of anemia remains."

In one of the cases of pernicious anemia studied by Jones and Joyce, a piece of liver cultured showed several colonies of *Staphylococcus aureus*. It would seem from a study of these cases that a number of organisms may be responsible for the hepatitis found in pernicious anemia.

In another of the cases of pernicious anemia reported by Jones and Joyce in which the patient died of uremia, the pathologist's postmortem examination revealed "Cardiorenal disease, arteriosclerotic kidney and extreme hyalin degeneration of the spleen, liver and adrenals." In this patient the degeneration of the liver may

have been secondary to the arteriosclerosis. The liver probably lost its endocrin function to control erythrocytolysis just as, in general arteriosclerosis, the pancreas is sometimes involved and the islands of Langerhans cease to secrete sufficient insulin, whereupon diabetes complicated the cardiorenal disease.

Jones and Joyce conclude by saying:

(1) "In every case of pernicious anemia with which we have personally worked during the time of this study, a chronic infection of the gall bladder has been positively demonstrated.

(2) "A small group of cases, which resembled mild pernicious anemia, possessed the same type of biliary infection, and upon its removal the patients were restored to normal health."

Other surgeons have observed evidences of pathological changes in the liver in operations upon the gall bladder, the infection probably having ascended from the biliary ducts to the liver cells. It therefore seems that a chronic hepatitis is a frequent condition, though rarely recognized or considered, until it is revealed by a gall bladder operation. Of course, every case of hepatitis is not followed by pernicious anemia any more than is every case of pancreatitis followed by diabetes. But the patient with a chronic gall bladder disease may be regarded as carrying an infection that may ascend into the liver and finally result in pernicious anemia. Therefore, the surgeon in performing a cholecystectomy in chronic gall bladder disease may remove the focus of infection of a hepatitis which might destroy the cells that secrete the anti-erythrocytolytic endocrin.

THE RELATION OF ACHLORHYDRIA TO PERNICIOUS ANEMIA

The English have long considered achylia gastrica as a precursor of pernicious anemia, and possibly as a contributing factor in the etiology of the disease.[14] The hydrochloric acid, which is one of the gastric secretions, has many functions; the formation of acid metaproteins from ingested proteins, the disputed regulation of the pyloric sphincter, the activation of prosecretin to secretin in the duodenum, and finally the function of a germicide. The clinical pathologist has long recognized the presence of living and flourishing bacteria in the gastric contents without hydrochloric acid, for example, the Oppler-Boas bacillus in the achylia accompanying gastric carcinoma. The absence then of hydrochloric acid, the antiseptic guardian of the gastro-intestinal threshold, is of serious import and consequence because it permits the indiscriminate entrance of variable quantities and qualities of bacteria, fermentative, putrefactive, and even pathogenic. The oral cavity and pharynx are the normal loci of certain bacteria which are tolerated by the existent local immunity. These harmless germs may become harmful when they pass into the small intestine, due to the lesions they produce, the toxins they generate, or the abnormal food decomposition they bring about. The bacteria themselves may penetrate the intestinal mucosa, together with their products, hemolytic or otherwise, and be carried by the portal system to the liver, where they are normally filtered out by the liver sinusoids. If there is a focus of infection in any portion of the alimentary tract, there may be secondary infection in the liver (hepatitis).

Even the fatty substances which have been accused (rightly or wrongly) of hemolysis might be conceivably due to some peculiar food decomposition, which in turn could be attributed to unusual bacterial activity due to the absence of hydrochloric acid in the stomach contents.

Achylia gastrica alone may predispose to anemia. Whether this could be in part due to secretin deficiency or inefficiency because of failure of conversion from prosecretin by hydrochloric acid, we are not yet prepared to say. We do believe, however, that active secretin has some influence on liver function, just as it has on gastric, pancreatic and renal function. Downs and Eddy,[15] utilizing acid extracts of the duodenal mucous membrane, found that the intravenous injection of such a solution stimulated the flow of bile decidedly, and they also noted a marked increase in the number of red corpuscles in the blood of rabbits. Thus 0.01 gram of a dried acid extract per kilo bodyweight after fifty minutes caused an increase of 17.07 per cent in the erythrocytes, and this persisted for an hour or more. It seems not improbable that the presence of hydrochloric acid in the duodenal contents may be necessary to stimulate the internal secretion of the liver that controls red blood cell destruction, and the lack of the internal secretion of the duodenal mucosa over a long period of time may permanently interfere with liver function.

It is more likely, however, that achlorhydria or a true achylia gastrica in rare cases is related to pernicious anemia not entirely as a predisposing etiological factor but as a concomitant condition. In other words, an infectious agent, as for instance the *Bacillus typhosis*, could cause a gastritis destroying or inhibiting the function of the hydrochloric acid secreting cells of the stomach and at the same time produce a hepa-

titis affecting the liver cells controlling erythrocytolysis. Friedenwald pointed out that achlorhydria may be a sequel of typhoid fever, and it is an accepted fact that cholecystitis, cholelithiasis and interstitial hepatitis may be of typhoid origin. It is conceivable that *B. coli* or other infections which are known to affect the abdominal viscera, may cause an unrecognized chronic gastritis and hepatis, finally after many years resulting in achlorhydria and pernicious anemia.

FUNCTION AND DYSFUNCTION OF THE LIVER

The liver is a great physiological laboratory. Dr. Frank P. Underhill, of Yale, once collected seventy different theories of function that had been ascribed to the liver. Most of us are familiar with functions so commonly attributed as the formation of urea, glycogenesis and glycolysis, production of fibrinogen, antithrombin and heparin (Howell),[16] the embryonic function of erythrocytogenesis, the storing of blood serum proteins and vitamins, its role in bile secretion, the deaminization of amino acids, the explosive liberation of depressor substances from the liver in shock (Manwaring), the detoxication of many poisons such as chloroform, phosphorus, alkaloids and the acrid poison of eclampsia. It is with no small degree of hesitation that one proceeds to ascribe another function to such a busy liver, but the student of cause and effect cannot help but believe that the liver normally plays a most important part in the maintenance of red blood cell equilibrium, and that in its dysfunction may lie the cause of pernicious anemia. The analogy here is very similar to the pancreatic dysfunction known as diabetes mellitus, which in certain cases probably follows pancreatitis, secondary to or associated with gastro-intestinal and gall bladder infections.

The liver of pernicious anemia is, without doubt, functionally and anatomically a sick organ. Its location as the great filter bed for the portal system subjects it to constant danger from infections and the noxious products which may be absorbed through this venous system. The stomach, duodenum, jejunum, ileum, cecum, appendix, ascending colon, pancreas, spleen, gall bladder and peritoneum drain into the liver. Hence it is not uncommon to observe multiple liver abscesses following suppurative infections of any of these organs. From the same sources a milder chronic infection may occur, or a toxin may be absorbed, which, acting over a prolonged period of time and in amounts so small at any one time as to escape detection by chemical investigation, can injure the liver in one or several ways. In one instance, the resultant liver change is that of a definite cirrhosis; in another, the liver becomes the seat of amyloid infiltration; and finally it is conceivable that in still another way the injury is localized in the red blood cell regulating mechanism, with a resultant pernicious anemia.

WHIPPLE'S "PIGMENT COMPLEX"

Whipple[17] uses the term "pigment complex" to indicate a group of substances which are essential parts of the mature body pigments. He believes that certain food factors contribute to this "pigment complex," as do also the body proteins and cells and also the disintegrating hemoglobin. Foods containing the pyrrol nucleus have the most effect upon this "pigment complex" (liver, spinach, strawberries, etc.).

Whipple has suggested that the liver may be concerned in building up "parent pigment substances" which are essential to the proper construction of mature red cells containing hemoglobin. He alludes to Sabin's work, in which she observed the blood cells in the second day chick embryo developing from the endothelial cells and angioblasts. At this period the liver, however, is not functionally active. There is an interesting relationship in early fetal life (human) between the liver cells and the islands of blood-forming cells.

"This would indicate a possible relationship between the liver cell, the Kupffer cell and the developing red blood cell. It is, of course, possible that this relationship continues through the agency of the circulation during adult life."—Whipple.

NOMENCLATURE OF DYSFUNCTIONS OF THE LIVER ENDOCRIN CONTROLLING ERYTHROCYTOLYSIS

With our present knowledge regarding the liver endocrin which controls red blood cell destruction, the nomenclature of its dysfunction is difficult; but the substance formed in the liver which inhibits the hemolytic function of the reticulo-endothelial cells might be called anti-hemolysin, or anti-erythrocytolysin, until something definite is known of what it is, or of which hepatic cells produce it. If there exists a deficiency of this substance, the secretion of the hemolysin by the reticulo-endothelial cells would be uncontrolled and pernicious anemia would result. Feeding liver, or the administration of a liver extract containing the substance, would supply the needed endocrin for controlling hemolysis, thus attaining the desired stabilization of the number of red blood cells in the circulation.

An excessive secretion of this substance, an

anti-hemolysin, would reduce red blood cell destruction, thus producing polycythemia. If this hypothesis is correct, the excessive ingestion of liver would produce polycythemia.

In one of our patients the blood count went from 1,200,000 to 5,000,000, at which time he was advised to reduce the amount of liver which he had been eating, whereupon his red blood count went down to 4,500,000. He resumed the liver and in a week his count went up to 5,100,000, and in three weeks, June 9, 1927, his red blood count had gone up to 5,210,000. We believe that if he continues to eat large quantities of liver he will develop polycythemia.[18]

It is said that in Strassburg, Germany, where liver sausage and pate-de-fois-gras make up an important part of the diet of its inhabitants, pernicious anemia is unknown, while polycythemia is of frequent occurrence. Since polycythemia occurs in persons who have not eaten an excess of liver, it would seem to be due to a dysfunction of the liver, a hypersecretion of the substance controlling red blood cell destruction.

We have been able to demonstrate that in certain persons there was an excessive production of insulin, which we called hyperinsulinism. They had hypoglycemic reactions similar to those following the administration of an excessive dose of insulin in diabetes, their blood sugar readings have been 70 mg. per 100 c.c. of blood. There is both an excessive production of insulin by the pancreas (hyperinsulinism)[19] and a deficiency of the secretion of insulin (hypoinsulinism or diabetes); in like manner it would seem that the liver may secrete an excess or a deficiency of the substance that controls erythrocytolysis.

Liver, spleen and bone-marrow have been anatomically and functionally closely correlated since embryonic life. Osler and Gardner[20] as early as 1877 emphasized the tendency of the bone-marrow cells (reticulo-endothelial cells) to phagocytize red blood cells, and Peabody and Broun[21] have even gone as far as to ascribe the cause of the anemia solely to this phenomenon. A rational and compatible explanation is that this is simply another expression of the deficiency of the liver endocrin which normally inhibits erythrocytolysis.

CONCLUSIONS

It is hoped that the clinical data presented and the hypothesis deduced from them, may offer suggestions that may be helpful in further researches on the etiology of pernicious anemia. The following are our conclusions:

1. It seems probable that the liver secretes an endocrin (anti-hemolysin) which controls the hemolytic action of the reticulo-endothelial Kupffer cells in the liver and perhaps in the spleen and bone marrow.

2. The pathological changes in the liver found in pernicious anemia and the association of gall-bladder infections with the disease as observed clinically suggest that a chronic hepatitis may inhibit the action of, or destroy, the liver cells that secrete anti-hemolysin, resulting in uncontrolled red blood cell destruction, thus producing the type of oligocythemia known as pernicious anemia.

3. It is unlikely that there is a specific infection responsible for the production of pernicious anemia but it is probable that many pathogenic bacteria, by producing hepatitis involving the endocrin secreting cells of the liver, may be factors in the etiology of the disease.

4. There may conceivably be two different relations between achlorhydria and pernicious anemia, a concomitant one and a contributing one. In the former, achylia gastrica has no etiological relationship to pernicious anemia, but is a concomitant condition resulting from a common infection of the stomach and liver which precedes the disease. Again, the achlorhydria may antedate the anemia for several years, in which instance the loss of antiseptic efficiency of the gastric juice may permit the entrance of pathogenic organisms into the duodenum, biliary passages, and liver, with a resultant hepatitis, followed by an erythrocytolytic endocrin imbalance.

5. The fact that as the blood picture returns to normal and the pernicious anemia patient's general condition improves following the ingestion of liver, while symptoms referable to the spinal cord remain unchanged, indicates that the cord lesions are not in any way related to the blood changes but are probably due to infection of the cord by the same pathogenic agent that produces the changes in the liver and stomach.

6. The anemia is relieved by liver diet, but the other pathologic conditions, such as the spinal cord lesions and the atrophic gastritis with achlorhydria, remain unchanged, so one can deduce from this that the liver changes and the consequent severe anemia are only a part of a rather widespread toxic or infectious process. In this sense pernicious anemia is not a primary anemia, but a secondary one.

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CONSERVATIVE MANAGEMENT OF PROSTATISM*

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So much has been written within recent years on the advances that have been made in the treatment of new growths of the prostate gland that it would appear offhand that nothing more remains to be said. With the wider use of the modern agencies with which the urologist is equipped, the mortality rate in prostatectomy seems fast approaching the zero mark. Unquestionably the two-stage procedure, along with the instituting of bladder decompression prior to the initial cystotomy, tends materially to lessen shock as well as to stabilize the renal threshold. Whether the approach to the gland be by the perineal or the suprapubic route seems of no great import. Equally good statistics are reported from either school. The choice of the anesthetic plays a most important part. Local analgesia for the preliminary procedures and ethylene-oxygen inhalation for the enucleation proper seem most popular. Such is the status of operable cases.

There is, however, a definite group of sufferers from prostatism, met with in practice, who are frankly poor surgical risks and who cannot, by all the means at our command, be made safe for surgery. I refer particularly to those men with marked retention who have advanced cardio-renal lesions which no amount of care will render sufficiently safe for prostatectomy. Usually the damage has not stopped with the kidneys and the heart. Not infrequently the serious damage to the liver, gall bladder, stomach and intestinal tract indicates that prostatectomy would indeed be a most precarious undertaking. The chronicity of certain pulmonary manifestations equally militates against surgical removal of the gland.

Within recent years, in particular, I have observed an ever-increasing number of such cases. The problem as to just how much can be done to relieve these unfortunates presents a perplexity not easy of solution. Simply to rest on the dictum that prostatics divide themselves into the operable and the inoperable cases is not sufficient. Many of the inoperable cases are not, by any means, to be considered as synonymous with hopeless. This I know from personal experience. Any number of my cases of inoperable prostatics have been alive and comfortable now for periods of as long as five years, and this in the face of statements of other surgeons that none of them would live over six months.

The conservative management of prostatism, therefore, seems worthy of discussion. Before taking up the reports, however, I trust you will indulge me one moment more in order that I may give my humble views regarding the cause

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of bladder neck obstructions attributed to new growths of the prostate gland. Aside from the 20 per cent of enlargements that are carcinomatous, the main cause for prostatism is adenomatous hyperplasia. One reads very little of prostatitis and its association with adenoma in the production of complete vesical retention. If we would take the pains to massage the prostate in every case of prostatism coming under observation, we would be astounded at the preponderance of pus and bacteria to be found in the secretion from many of these individuals. And further, by systematic, gentle massage, many a gland could be appreciably reduced in time, thereby improving the emptying power of the bladder. Unquestionably many cases of enlargement of the prostate have superimposed upon the new growth structure an inflammatory condition of variable degree which may play an important part in the causation of retention. For the past ten years I have been making a special study of bacterial invasion in so-called hypertrophy of the prostate gland and my unpublished researches confirm the above stated attitude.

CASE REPORTS

Case 1.—Mr. N. T. B., 65, a farmer, first came under my observation in 1922 with acute retention. An indwelling catheter was introduced and urine drawn off at intervals, no more than 500 c.c. being removed at any one time. The urine showed heavy albumin, pus and *B. coli* each four plus, many casts and many red blood cells. Per rectum the prostate was very large but not stony or irregular. Prostatic secretion contained pus 20 to the field, staphylococci and *B. coli* each two plus. His hemorrhoids were the largest that I have ever seen. The internist reported that his heart was markedly enlarged to the left, the aortic second sound was much accentuated, arteriosclerosis was advanced, and the lungs were normal. His blood pressure was 100/80. 'Phthalein reading was 12 per cent for two hours. Blood chemical examination revealed a non-protein nitrogen of 66 and a creatinin of 3. Radiographic films were negative for stone in the urinary tract.

An indwelling catheter in the urethra was used alternately for two months. Prostatic massage was practiced every other day. By this treatment the gland was materially reduced in two months; the prostatic secretion showed much less pus and bacteria than at the beginning. The 'phthalein finally rose to 18 per cent; blood non-protein nitrogen dropped to 30, while the blood creatinin dropped to 1.2. Suprapubic cystotomy, under novocain analgesia, was carried out and a large Pezzer catheter left in. The patient had a stormy convalescence. He finally returned home and was placed in charge of his family physician. Prostatic massage was continued once a week. He still wears this Pezzer drainage tube and his urine is fairly clear. Every three months he reports in for a check up and a new tube. The 'phthalein remains around 15 per cent and his blood chemical readings are proportionate. Prostatectomy, in my opinion, would have been fatal to this man. As it is, he remains well and contented after five years of conservative treatment.

Case 2.—Mr. M. P., 64, a fisherman, was admitted to my hospital service in 1923 with acute retention. Indwelling catheter drainage was intermittent. The urine revealed an excess of pus, blood and *B. coli.* Per rectum digital exploration revealed a typical benign adenoma of enormous proportions. At massage the prostate secretion showed 40 pus cells to the field and an excess of bacilli. The internist reported chronic myocarditis and chronic bronchiectasis. His blood pressure was 105/80. 'Phthalein was 9 per cent for two hours. His blood non-protein nitrogen was 55 and creatinin 2. No calculi were found at x-ray. This man was in a profoundly toxic condition and any type of surgical procedure then would have killed him. Three physicians who had attended him expressed the opinion that he could not live a week. Alternate indwelling catheter drainage was supplemented with massage to the prostate every other day.

Within three months after treatment was begun the 'phthalein rose to 22 per cent; blood chemical study revealed a non-protein nitrogen drop to 30 and a creatinin of 1.2. He had gained 20 pounds in weight and stated that he felt thirty years younger. Under local analgesia, suprapubic cystotomy was done, the diagnosis of adenoma was confirmed and Pezzer catheter drainage instituted. Prostatic massage was given weekly for two years. Last November the patient refused operation and demanded that the Pezzer be removed, stating that, by clamping off the catheter, he could void normally through the urethra. The suprapubic fistula healed promptly and repeated checks at the office fail to reveal any bladder residual now. His urine is only mildly infected. By rectal examination it appears that the adenoma is reduced to fully two-thirds its original size in 1923. This patient is perfectly content with the outcome and so am I.

Case 3.—Mr. L. W., 71, a grocer, was first seen in 1924 suffering with frequency and difficulty in voiding. At first examination he could void only a drop of urine at a time, and he suffered intense pain with each attempt to urinate. Intermittent indwelling catheter drainage was instituted. The urine showed heavy albumin, excess of pus and *B. coli.* The prostate at rectal palpation was very large, firm and regular, but not stony to the feel. Secretion from the prostate showed 15 pus cells to the field and many *B. coli.* Cystoscopy confirmed the diagnosis of adenoma of the prostate. X-ray films were negative for stone. The internist advised against operation on account of his low blood pressure of 90/75. A two-hour 'phthalein reading was 11 per cent. Blood chemistry showed a non-protein nitrogen of 70 and a creatinin of 3.5.

Indwelling catheter drainage was continued for four months and prostatic massage given twice a week. Again the gland was noted to reduce materially in size under massage and drainage and the secretion microscopically improved in proportion. The 'phthalein later read 15 per cent for two hours, the blood non-protein nitrogen was 22, while the creatinin was 2. Under novocain analgesia suprapubic cystotomy was done and a large Pezzer catheter was left in the tract for drainage. The patient was sent home to a distant state under the care of his family physician, where he has since received a weekly prostatic massage and irrigations as indicated. His renal function and his blood chemistry have never improved sufficiently to warrant prostatec-

tomy. He remains comfortable and alive at this writing.

I could recite other instances in which conservatism in handling old prostatics brought rewards. All were cases where no rational surgeon would for an instant consider major surgery. Still, such measures as I have outlined above in the brief case reports brought the patients comfort and life extension. I appreciate full well that nothing that I have done for these patients is original. Many urologists are today practicing conservatism, not only in the management of surgical ailments of the prostate, but also such procedures are selected by them in dealing with kidney lesions in which, for one reason or another, radical measures are counter-indicated. There remains nevertheless a small group of men doing genito-urinary surgery and a larger group doing general surgery who appear still inappreciative of the benefits to be derived from conservative measures in dealing with prostatic disease in aged and seriously debilitated males. To those who have given these non-operative procedures little or no consideration, I make my plea.

In conclusion, I would but reiterate that cases of prostatism which are poor surgical risks should be studied more assiduously from a medical standpoint and given all benefits that may accrue from laboratory tests. Repeated readings with 'phthalein should be tabulated; blood chemical studies should be made in series; and blood pressure observations should be recorded at regular intervals. By the adoption of systemic, properly given massage to the gland wherever infection is demonstrated, much can be accomplished. The indwelling urethral catheter is truly a boon in this type of case and when intelligently supervised gives no discomfort to the wearer. The two procedures employed conjointly, prostatic massage and the indwelling catheter, will, in many instances, suffice to give the patient the necessary relief in prostatism. He will empty his bladder better as time goes on and not infrequently the bladder residual will be materially reduced. Finally, suprapubic drainage must be given an accredited place in the management of prostatics who cannot undergo prostatectomy. The Pezzer catheter has unquestionably saved thousands of lives. Let us strive for a more universal appreciation of its merits.

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DISCUSSION (*Abstract*)

Dr. E. G. Ballenger, Atlanta, Ga.—Conservatism in dealing with obstructive lesions of the ureter, stones in the ureter, prostatic obstructions and urethral strictures is most important. We must agree that Dr. Walther is correct in urging that the patients be spared radical operations when milder measures afford a fair chance for relief. Tight urethral strictures and quite large ureteral stones may be well managed without operations. Immediate removal of a hypertrophied prostate with the first attack of retention in an elderly patient is not wise. In not a few instances the proper application of palliative measures may enable the patient again to void in a more or less normal manner and reduce the residual urine, sometimes, to the vanishing point.

Measures less radical than major operations should be tried reasonably at first, and adequate preliminary investigations and a careful study should always be made before radical operations are performed. We have been surprised, not infrequently, at the reduction in the size of a prostate gland after a week or two of preparatory treatment. Palliative measures reasonably applied will lessen our mortality rate.

Dr. E. Clay Shaw, Miami, Fla.—While I agree with Dr. Walther that some patients require conservative treatment and must be discharged from the hospital with a suprapubic drainage catheter, such patients should be carefully followed up with the idea of giving complete relief at a later date if possible. If a patient can live for several years with an indwelling suprapubic catheter, there must be some time during this period when he is capable of standing prostatectomy. Practicing in a tourist city, I have been impressed by the number of patients going around with indwelling suprapubic catheters unnecessarily. Some of these cases, at first unable to stand operation, develop good renal function and become safe risks for prostatectomy.

Dr. Albert E. Goldstein, Baltimore, Md.—The application of non-surgical treatment in prostatism may fall to five types of cases:

(1) Inoperable cases, such as advanced malignancies.

(2) Cases where operation is contra-indicated on account of other conditions, such as severe renal insufficiencies, marked arteriosclerosis, or severe cardiac conditions, which do not respond to the usual pre-operative treatment.

(3) Cases thaf refuse operation for various reasons.

(4) Cases that might be placed in the borderline group.

(5) Cases with acute respiratory conditions.

The various procedures carried out for these five types have varied according to the condition presented. I am excluding in this discussion such procedures as cystostomy, punch or electro-coagulation, as these are surgical procedures. In the various clinics the procedure varied. They include the following:

(1) Massage of the prostate.

(2) Radium applications.

(3) X-ray therapy.

(4) Bilateral ligation of the vas deferens.

(5) Dilatation of vesical orifice.

(6) Retention catheters with hot sitz baths.

(7) Injections into the enlarged prostate of foreign solutions, such as pepsin Pregl's solution.

(8) Injections into the prostate of animal or human blood.

The first procedure, that of massaging of the prostate, is contra-indicated in the adenomatous types, as it aggravates the condition by increasing the edema. No satisfactory results have been observed. After radium applications, some clinics report reduction in size and improvement in both the benign and malignant types. In our clinic the use of radium has been very limited. Among the malignant cases that we have seen where radium was applied, no beneficial effects could be observed. In the benign type where beneficial results were obtained, they were only temporary and resulted in a difficult removal when operation was decided upon. X-ray applications in our clinic have never been tried.

Bilateral ligation is an old form of treatment, and in some instances has resulted in some reduction of the size of the prostate and some improvement. According to Stutzin, of Berlin, in December 1925, in the *Deutsche Medicinische Wochenschrift*, prostatectomy is the procedure of choice. He has tried bilateral ligation of the vas deferens in six cases. In two no results were obtained, in one there was some improvement, and in three complete cures of retention with improvement in urinary symptoms.

Dilatation has been tried in our clinic with temporary improvement in the stream and some reduction in residual urine, but the condition was found to return after a period of time, and operation finally was necessary.

Retention catheters with hot sitz baths produced good results, especially where a respiratory condition was responsible for the retention. Placing the bladder at rest and reducing the congestion has in many instances resulted in complete emptying of the bladder with no further difficulty for many months.

Injections of pepsin Pregl's solution has been tried by Hoffheinz in Leipsig, who reported in 1926 some good results, but preferred operation, and advised that injections be used only where operation was contra-indicated.

Interesting experiments have been performed by Arthur Hintze, of Berlin, who reports in this year's *Deutsche Zeitschrifte fur Chirurgie* the injection of animal or human blood with applications of x-ray. He reports good results in ten cases and failures in nine others. In only one case was a perfect result obtained. He likewise advocated the use of the method only where operation is contra-indicated.

I am not in accord with any of these methods, and believe if we can get the patient to the point of operation it should be done. If not, we should use retention catheters. This brings us back to the question of whether to do primary cystostomy or drain the bladder with the catheter. After everything has been tried and no result obtained, then possibly in the carcinomatous type of prostate, a suprapubic cystostomy may be indicated.

Dr. A. Mattes, New Orleans, La.—I am glad to see no paper on the program relative to the merits of one type of prostatectomy versus another, but instead a paper on conservative methods in the handling of prostatic cases. It should be remembered that the person who sees the patient first is the one who should practice conservatism, and not the one to whom the man is sent later for some definite type of procedure. It is to the general practitioner that the measures outlined by Dr. Walther are of the greatest usefulness. By the time the patient reaches the urologist he has gone through heat, massage and everything that is of value, and if we wish to practice any type of conservatism it should be the use of some procedure to remove the obstruction from the bladder neck, either as a preliminary trial or a final measure.

Dr. J. H. Wallace, Oklahoma City, Okla.—In the type of prostate that extends high, massage will give beautiful results, provided we remove the focal infection. As a rule, in these cases the patients have a mouth full of bad teeth, and oftentimes the gums are receding and infected. If these are removed and conservative massage is introduced, the trouble will often subside and the patient will remain comfortable. We should not be too quick about advising prostatectomy. If there is acute retention and a fairly large prostate, we should advise removal. Oftentimes the patient will consent, but oftentimes he will refuse, and then, if conservative measures are introduced, he frequently will go on and live to a respectable old age. I recall a patient seen in 1918 who refused operation and who is alive at this time following conservative measures.

I am using the Caulk cautery punch in my old patients with good results in certain types.

If the patient can carry the indwelling catheter for six months or a year, he can be built up sufficiently to undergo prostatectomy.

Dr. George R. Livermore, Memphis, Tenn.—Some time ago Dr. Caulk cited quite a number of cases in which he had used his punch in hypertrophied cases with good results. Since Collings has gotten out his electrotome, I have used that satisfactorily.

I wish to report such a case in a man aged 76, who refused operation, although he was in condition to stand it. We used the indwelling catheter for two months and brought his condition up to where I thought it was perfectly satisfactory, but he would not consent to operation. We have used the Collings electrotome six times now, and have reduced his residual urine from twelve to two ounces. The patient is comfortable, sleeps four or five hours at night, goes for several hours in the daytime, and I think this method is well worth trying in such cases.

PRESENT STATUS AND FUTURE COURSE OF THE CANCER PROBLEM*

By L. A. TURLEY, A.M., PH.D.,†
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All that has been done of any value in the field of cancer research may be grouped under two heads: that on the cause of cancer and on the cure of cancer. My remarks will consider the cancer problem under these two heads.

CAUSE OF CANCER

The work and thought that have been directed toward the solution of this problem have taken two widely different trends. On the one hand,

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in the attempted solution of this problem, an enormous amount of time and energy and thought has been expended on a type of quest that has been characteristic of human thought and endeavor from the dim beginning of history, namely: the search for one fact, or factor, which is responsible for a certain type of phenomenon. The search for a universal solvent; for a universal antidote; for the philosopher's stone; for the fountain of youth; for a panacea; the search for the mother lode, have one after another occupied the time and attention and minds of scientific and lay investigators throughout the ages. And, while one by one they have been laid aside or discarded, there still lingers in the human mind a dim hope that some day some or all of these will become a reality. So it is with the cause of cancer. From the time when cancers were first recognized and described until the present moment, able scientists and investigators have spent their lives, enormous sums of money and other resources in the attempt to find the one cause of cancer. And, like all the other universal principles above mentioned, in the light of our present knowledge all such efforts and expenditures have been in vain and are doomed to failure for a variety of reasons. On the other hand, scientific thought and experiment have tested every etiological factor known to pathology as an explanation for this lesion, and in such pursuit there has been considered every factor known to science, or that could be conjured up by the imagination. We have been surprised that no one has come forward with the theory that cancer represented a reversion to that type of primordial reproduction known as budding. Recently there have been some signs that such a theory is in the process of formulation, because it has been stated that in every group of cells in a multicellular organism there were cells concerned chiefly with the fundamental function of reproduction and that it was the wild growth of these reproductive cells which resulted in cancer formation.

Each of the two lines of investigation mentioned above has been disappointing in that neither seems to have gotten us any nearer a solution than other such quests for universal facts in physical science, in biological or social life. We are left in our original state of hopeless ignorance of the cause or causes of this great and increasing menace to human life. However, we must remember that such quests sometimes are of great value because of negative results. At least they show us where not to look or what not to look for and, further, sometimes reveal here and there glimpses of truth that are valuable in the final solution. Therefore, it is worth while to examine our results so that we may not continue repeating the same useless effort and may glean those things that are of value to us.

So far as the search for the one cause is concerned, not only have we not found it, but the more we find out about the condition the more we find that any further effort looking for some one environmental factor is futile and a waste of time.

A review of the investigations of various factors can be grouped under several heads and can be considered briefly under those heads.

Infections.—The experience in the clinics and the experiments in the laboratories agree in telling us that infections play an important part in cancer formation, not that any one infection or group of organisms can, or is, universally responsible for these lesions, but that there are many organisms that may, and can, play a part in cancer formations. These may be bacterial, protozoan or metazoan parasites, or even ultramicroscopic viruses. The fact we have gained from the observations and experiments is that it is the character of the fundamental lesion rather than the type of organism present, in most cases at least, that is responsible for the tumor formation. The work of Gye, which a few years ago electrified the world, has summed itself up into the simple fact of adding one more biological factor that may play a part in tumor formation.

If we will but study tumors themselves and consider them from the standpoint of possible infectious origin, we will either have to conclude that there are a great many infections that may play a part in cancer formation or else revise our whole conception of the effect of infections on tissues.

All of the infections we now know produce a rather definite type of lesion, such as necrosis, necrosis and proliferation, proliferation with little or no necrosis, or fever. And, while the lesions in different cases vary in their manifestations, nevertheless they are fundamentally a certain definite type of reaction, so much so, that, knowing the character of the lesion, we are pretty sure of the etiological agent. In contrast to this, cancers not only vary greatly in different cases but we find a great many different types of cancer arising from the same tissues. Thus there are seven types of carcinoma aris-

ing from stratified squamous epithelia. If these were all of infectious origin, that is, caused by some different infection, we should have to assume that there are seven cancer germs, or else we should have to assume that cancer represents, both on the part of its etiological agent and tissue reaction, a very unique biological fact very different from anything else known in the whole realm of biology. The proponents of the infection theory would have to explain why in one case we find an adenofibroma, in another case an adenoma, in another case a scirrhous carcinoma in any one of its various forms, and in another case a carcinoma medulare, all arising from the same tissue. Further, it seems to us that the work done by Tyzzer and others on transplantation would definitely prove that cancers are non-infectious in origin. The one apparent exception to this now known, the Rous sarcoma, seems more properly to belong with the specific granulomata than with the neoplasms. Furthermore, there are many instances of neoplasm where there is not at the time of neoplasia, or as far as can be determined at any previous time, infection of any kind. While it is perfectly possible that in these instances there may be some filterable virus at work, the occurrence of the lesion can be very fully explained without falling back on these unknown and more or less hypothetical factors.

Mechanical Cause.—This once satisfactory explanation of the cause of cancer has recently been almost totally neglected. For the purposes of this paper, it can be dismissed with a very brief consideration. First, those parts of the body which are most subject to trauma, for example, the feet, are rarely the site of cancer; whereas, in other parts of the body, for example, the brain, which is practically never subject to trauma, neoplasms are comparatively common. Second, people whose bodies are subject to a very great amount of trauma, for example, certain types of day laborers, carpenters, mechanics and football players, do not have carcinoma as commonly as people whose bodies receive little or no trauma, such as professional men, clerks and teachers. Nevertheless it cannot be denied that trauma plays a part in tumor formation. Here again it is not so much the fact of trauma *per se* as the character of trauma, the location of trauma, and the character of the reaction of the tissues that is responsible for cancer formation.

Chemical Causes.—The fact that certain classes of laborers who come in contact with chemical substances are frequently subject to tumors in those parts of the body exposed to the action of chemicals has led to a great deal of investigation as to the effect of chemical factors in the cause of cancer. In all, something over one hundred and fifty different chemical substances have been tried, but so far only those related to fats or fat solvents have yielded any results. These results have not been very conclusive. In the experiment using coal tar, daily applications for as long as five hundred and eleven days finally resulted in a lesion which later became the site of a cancer. Haga's experiments with lanolin resulted, after long continuous feeding, in a lesion of the stomach which became the site of a cancer. In most of these cases the initial lesion produced by the application of these substances was in all probability merely a reparative process which, like any reparative process, may later be the site of, or induce, cancer growth. Another type of chemical experiment that has been carried on extensively is the alteration of the chemical ratio of the tissue fluids. Here again no definite cancer has been produced, but apparently conditions have been produced which were favorable to cancer growth. So, with this line of investigation as with others cited above, the occurence of cancer following the administration of or association with these various chemicals seems to depend more on the tissues affected and the reaction of these tissues than on the specific injurious agent acting.

Photic Causes.—The existence of what is known as "cancer skin," or a skin which readily develops epithelioma and the apparent increase in the occurence of these lesions on such parts of the skin as are exposed to sunlight, has led to a notion that sunlight may play a part in cancer formation, but to date no definite experiments have been carried on to prove or disprove this notion.

The frequent occurrence of superficial cancers among the x-ray workers has led to a rather firmly rooted opinion that x-ray can be considered as an etiological factor in cancer growth. This opinion is supported to a considerable degree by the publication of reviewed statistics on the effect of x-rays following operation for cancer. It seems to be a pretty well founded fact that the use of x-ray following operation for neoplasm should be done with extreme caution and consideration of many factors, because there are many cases in which the evidence is all but conclusive that the recur-

rence or the occurrence of cancer at the site of operation has been due to the unwise use of x-ray. Just what part the radiation actually played in the occurrence or recurrence in or near the old site is something that has not been definitely proved. At least, there is evidence enough at hand to indicate that this condition should be very thoroughly investigated and the use of x-ray in neoplastic diseases modified by the findings of this investigation.

The use of infra-red and ultra-violet light has not been extensive enough to date to give any indications as to their effect on the occurrence of neoplasia. Perhaps they, too, may have some part. At least, in view of the effect of other radiations, it would be wise to make a pretty careful study of these factors so that, if they do play a part, we may know it before the population of cemeteries has been increased because of the promiscuous or unwise use of these therapeutic agents.

In reviewing this whole field of scientific investigation, one is struck by the appearance in every case of an identical factor, that is, the tissues themselves. We are perfectly justified in stating that if any appropriate tissue is exposed to the action of biological, mechanical, chemical, photic, and other environmental factors for a sufficient length of time and in certain definite degrees of intensity, that cancer will appear at the site of insult. In other words, cancer potentiality resides within the cells themselves; and all the known facts with regard to cancers, causes, kinds, occurrences and effects can be explained without the introduction of any factor outside the body itself. Therefore, in order to understand this problem, we must turn our attention more directly to the cells and their inter-relations.

Anyone who makes a careful study of the suspected etiological factors is struck by the fact that in all of the investigations which have been carried on so far in all fields indicated above, too much attention has been paid to external factors and too little attention paid to the vital principles and relationships of the cells and tissues. The biggest field of promise now in sight on the horizon of this problem is the better and more complete understanding of the operation of fundamental biological principles, as they are manifest in individual tissues and the effect of the inter-relationship of one tissue to another. The work of Tyzzer and Maud Slye has definitely proven that the cause of cancer must be sought within the body itself. Everything that we know about cancers at the present time, the tissues in which they occur, their manner of growth and spread, their effect on the host, can be fully explained on the basis of biological laws and facts already known. The common, so-called "baffling mystery," that is, the inception of cancer growth, can be more fully explained by the application of these laws than can other well known processes, such as the healing of a wound. No one has ever questioned why a wound heals. We have gone on accepting this phenomenon because it was to our advantage and yet, if we stop a moment to think, the fact that a wound should heal at all is a greater mystery than the occurrence of cancer. Perhaps, if we knew more about why a wound heals, it would prove a searchlight in the apparent darkness surrounding the cancer problem. In fact, to my mind, the cause of cancer is not nearly so mysterious, nor marvelous, as the simple fact that a wound should heal.

THE CURE OF CANCER

Every therapeutic agent ever known has been applied to cancer in the hope of finding a cure. All types of drugs applied internally and locally, electricity applied as electricity, either Galvanic or Faradic currents, mechanical agents applied either as a definite pressure or abrasion, x-ray and radium, serums and, recently, ultra-violet light, have been tried and found wanting. None of these has given us sufficient grounds for more than occasional use in carefully selected instances. At the present time, unquestionably surgery is the sheet-anchor of cancer treatment. It is quite true that cancers may be cured by x-ray and radium, provided these agents can be applied directly to the neoplastic tissue. But present indications are that if they cannot be applied directly to the neoplastic tissue, or if they are not used with extreme caution, the x-ray at least may be a powerful aid to cancer growth rather than to its extermination. The one exception now known to this is the use of x-ray in that form of neoplasm known as leukemia.

Most authorities now state that if x-ray is to be used in connection with cancer treatment it should be used before and not after the operation. If this is done at the time of operation, the majority of that tissue which is exposed to the most violent action of the radiation is removed, and in all probability it is this fact which gives the brilliant results obtained by some surgeons in the combined use of x-ray and surgery. Surgery is effective only when the

operation removes every neoplastic cell, and it is effective because it not only gets rid of the wild cells themselves but removes from the system the effect of these wild cells on other cells. It is undoubtedly true that the metabolic products of neoplastic cells act as an internal secretion on other cells in the body and undoubtedly sometimes excite to neoplastic growth cells which would not otherwise become neoplastic.

With regard to the cancer problem, as is the case with other disease conditions, considerable attention has been paid to the prevention of cancer. The education of the laity to the signs of early cancer growth or conditions favorable for cancer growth has done a great deal along this line. But the increase in occurrence of cancer is more than keeping pace, actually gaining on this means of early detection and prevention of fatal neoplastic growth. Something else must be done. At present, we have but dim indications as to what these measures are to be. The work of Tyzzer and Slye has definitely proven that the tendency to cancer growth and the ease with which tissues may be incited to cancer growth is a hereditary characteristic. This means that the cancer problem has an eugenic aspect. The work of Haga and others, and such facts as the greater frequency of gastric cancers in Chinamen and Chinawomen in view of the difference in their gastronomic habits, indicate that dietary factors must be considered. In all probability the use of salad dressings and various food seasonings are an important factor in the occurrence of gastric carcinoma; perhaps, also, of cancer in other parts of the body. Unquestionably there is a dietary aspect to the problem.

The recent rapid increase in the occurrence of primary cancers of the lungs, together with the fact cited above of the frequent occurrence of cancers in certain industrial workers, indicates that there is an industrial aspect to the cancer problem. Not only must industrial workers be protected from the physical contact with chemical substances but also some means must be devised for taking care of and disposing of industrial gases. Back of these and fundamental to all statements, if we would come to a full understanding of the cancer problem, there is necessary a far greater knowledge of the operation of the fundamental biological process in multicellular organisms; a far greater knowledge of the inter-relationship and mutual effect of cells on cells in a given tissue and of one tissue on another; and a greater knowledge of the effect of the immediate environment of the given cells on the fundamental vital principles. Instead of wasting our time searching for one great cause, or chasing this or that will-o'-the-wisp of a contributing factor, we must turn our attention more intimately to the body itself, realizing that every living cell in the body is a potential neoplasm and all that is necessary to make it an actual neoplasm is the presence of the appropriate factors in its environment.

DIAGNOSTIC DIFFICULTIES OF STOMACH DISEASES*

By J. E. KNIGHTON, M.D.,
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It is a well known fact that many extragastric conditions produce functional disturbance of the stomach, and sometimes these conditions present problems which require most careful differential diagnostic study in order that correct conclusions regarding them may be reached. I shall not consider any cases belonging to this class.

Diseases of the stomach proper are few in number and a great majority of these are so clear-cut and well defined in their clinical manifestations that a diagnosis is comparatively easy.

Every case should be studied critically from the standpoint of history, symptoms, physical findings, laboratory tests and roentgen-ray examination. When these procedures are carried out in a careful and intelligent way, they will lead to a correct diagnosis in a large majority of cases. This is usually true in cases of gastric ulcer and the same may be said of a great many cases of primary cancer of the stomach.

Take for an example, a patient who consults the physician for stomach trouble and gives a history something like the following: he had never had disturbance of digestion until three or perhaps six months prior to this consultation. The distress was mild at first, but gradually became more and more pronounced and severe. Since the beginning there have been no remissions, but the symptoms which at first consisted only of a feeling of discomfort in the epigastric region have gradually developed into pain, nausea and finally vomiting of large quantities of food, some of which has been recognized

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as portions of meals taken on previous days. The patient has lost weight and strength rather rapidly, and he is anemic in appearance. Physical examination shows a well defined and easily palpable mass in the epigastric region. Gastric analysis shows complete absence of free hydrochloric acid and a strongly positive test for lactic acid. You at once feel sure that you are dealing with a case of primary cancer of the stomach and the subsequent course usually verifies your impression.

However, all cases of cancer of the stomach are not so easily diagnosed, the following case report being a fair example:

D. H. H., a white farmer, age 74, complained of stomach trouble. His family history showed nothing significant.

He had had the usual diseases of childhood, but no other illness of importance, and no venereal disease.

The duration of the present illness was one year. Prior to that time, he had always enjoyed good health and had no disturbance of digestion whatever. The onset was gradual, and the symptoms consisted of a burning sensation in the region of the stomach. This condition gradually grew more pronounced and after about six months he developed nausea and vomiting, but no marked pain. Very soon after eating he observed a rumbling sensation in the stomach which was followed by nausea and vomiting, and apparently very little food was retained. About one month prior to examination, very dark coffee-colored material was vomited and at about the same time he passed very dark colored stools. His appetite had remained good. The bowels were rather obstinately constipated and he had lost fifty pounds in weight.

Physical examination showed a man rather senile in appearance with nutrition markedly below normal, and well marked general arteriosclerosis. The mouth and throat appeared healthy except for the loss of teeth.

The chest showed nothing abnormal, except a systolic cardiac murmur at the apex which was not transmitted.

There was some rigidity in the upper right quadrant of the abdomen with tenderness upon pressure. The liver was slightly enlarged, and the spleen not palpable. Visible peristaltic waves were passing across the epigastrium from left to right.

Laboratory Examinations.—There were 4,300,000 red blood cells and 6,240 white cells. Differential counts showed the various types of cells within normal limits. Hemoglobin was 75 per cent. The Wassermann was negative. The urine showed nothing abnormal chemically or microscopically.

Analysis of stomach contents withdrawn one hour after eating the usual Ewald test breakfast showed an excessive quantity with free hydrochloric acid 12 and total acidity 36. Aspiration of the stomach after fasting overnight showed considerable food remnants from meals of the previous day with a strong positive test for free hydrochloric acid.

Upon roentgenologic examination the stomach was seen to be moderately dilated, but having rather active peristalsis. The pylorus was almost completely obstructed, but the outline of the pyloric end of the stomach was smooth and regular and gave no indication of being encroached upon by a new growth.

Surgical treatment was advised, and when the abdomen was opened and careful exploration done, it was the opinion of the surgeon that the obstruction was due to scar tissue resulting from ulcer of the pylorus, that it was probably not malignant.

A posterior gastro-jejunostomy was done and the patient made an uneventful recovery from the operation.

Reports from the patient a few months later were to the effect that he had fully regained his weight and strength, was having no digestive disturbance whatever and was able to do active labor on the farm.

The patient consulted me first on April 29, 1925, and the operation was done on May 4, 1925.

On July 27, 1927, more than two years after the operation, he came to see me again. He stated that he had remained free from symptoms until about four months prior to the date of this consultation. During these latter months he had been suffering from nausea, vomiting and pain in the region of the stomach and had lost weight and strength rapidly.

On physical examination at this time, a well defined, easily palpable tumor of irregular outlines was observed in the upper abdomen. Roentgen-ray examination showed the stomach contents passing fairly freely through a gastro-enterostomy opening, but the characteristic appearance of a malignant growth involving a large portion of the stomach. The patient died September 11, 1927.

The following case is in many respects similar to the preceding report. The history, however, was distinctly different.

Mrs. C. B. J., age 57, complained of stomach trouble. She had been troubled with gaseous distension, burning pain in the epigastric region, and occasionally nausea and vomiting over a period of twelve years. During this time there had been numerous intervals of comparative freedom from symptoms, but recurrences came from time to time without any apparent cause. The greatest discomfort was felt soon after meals, there being no food relief. During recent months the symptoms had become more pronounced. She was suffering severe abdominal pains and frequent nausea and vomiting. Large quantities of food were often vomited, which showed fragments of meals taken on previous days. No blood was vomited at any time during the illness. The appetite was poor, bowels were constipated, and there was considerable loss of weight.

Physical examination showed rather marked emaciation. Mouth, throat, heart and lungs were normal. There was rigidity of the muscles of the upper abdomen with tenderness to pressure, but no palpable tumor. Blood examination gave the usual picture of secondary anemia. The urine was normal. Stomach contents aspirated after fasting overnight consisted of large quantities of food which had been eaten on previous days. The analysis of this specimen gave free hydrochloric acid 50 and total acidity 85.

Roentgenological examination showed a fish hook type of stomach abnormally large, freely mobile, with no peristalsis, and tender at the pylorus. The pyloric area showed constriction. The duodenal bulb was deformed and tender to deep palpation.

Posterior gastro-jejunostomy was done by Dr. J. C. Willis on January 19, 1920.

The obstruction appeared to be due to scar tissue from a chronic ulcer. The patient made a prompt recovery from operation and has remained well up to this time, a period of seven and a half years.

It will be observed that these two cases were very much alike in several respects. Both were well advanced into the so-called cancer age, both gave symptoms of gastric stagnation, both had free hydrochloric acid in their stomach contents, and both gave the appearance of benign pyloric obstruction when operation was done by an experienced surgeon. And yet the subsequent histories of the two cases have proven that one was malignant and has since died as a result of this disease, and the other was non-malignant and is still living and well seven and a half years after operation.

When we compare the histories of these two cases, we see some striking differences. The duration of symptoms prior to operation in the case that proved to be malignant was only one year, while the non-malignant case gave a history of symptoms over a period of twelve years.

In the malignant case, the symptoms were continuous and progressively more marked, while the non-malignant case showed numerous periods of comparative freedom from symptoms.

At this point we might raise the question as to whether simple peptic ulcers ever become malignant, or are those that appear to have developed malignancy really malignant from the beginning.

There is room for argument on both sides of the question.

DISCUSSION (*Abstract*)

Dr. William Gerry Morgan, Washington, D. C.—The diagnosis of disease is that phase of medicine which lifts the practice of medicine up out of an intolerably dull routine and makes it one of the most interesting, absorbing and exciting of vocations. I am fond of termining it the what-is-it of the daily practitioner. And, of course, differential diagnosis is the center of the picture and, as our scope broadens, becomes of increasing importance.

Long before surgery drew attention to the upper right quadrant area the differential diagnosis between gastric ulcer and gastric cancer occupied the attention and thoughtful consideration of clinicians. Whereas we have made considerable strides in this direction, we have not as yet reached quite the pinnacle of desired results in early differentiation between these two very serious diseases. If, however, a proper appreciation of gastric ulcer is entertained, a mistaken diagnosis between these two disease entities is not fraught with such serious consequences to the patient's best interest as in other regions of the body, inasmuch as both call for prompt surgical intervention.

When an individual comes to our clinics presenting early symptoms of gastric disease, we must consider the entire field of disease possibility common to this area of the body. In our experience, we divide those possibilities into three divisions:

(1) Extrinsic gastric lesions, as for instance, lues, ulcer, cancer and benign tumors.

(2) Contiguous lesions which are carcinoma of the pancreas, gall bladder disease and sub-diaphragmatic lesions.

(3) Constitutional lesions, such as achylia gastrica, pernicious anemia, chronic catarrhal gastritis, deforming ptosis accompanied by delayed emptying, and heart disease.

Dr. W. D. Haggard, Nashville, Tenn.—No one is more keenly aware of the difficulties of diagnosis in gastric lesions than is the surgeon. I believe the lesson to be learned from Dr. Knighton's very admirable paper would be the unwisdom of doing gastro-enterostomy for gastric ulcer. Our attention was first called to that by the statistics of one of the large life insurance companies which showed the surgeons that in a given number of patients who had gastro-enterostomy for gastric ulcer at the end of two years three times as many people were dead as would have died within the same age limit. That meant one thing to the surgeons in the management of gastric ulcer, namely: that many ulcers which we thought were ulcers *per se* were really cancer. So while we formerly did gastro-enterostomy for ulcer in an evolutionary stage, I think it is pretty well conceded now that it does not cure. That would not be so bad if it remained an ulcer and was not cured, but if it is potential carcinoma, then we have a very distressing experience as outlined here. Any lesion more than 2 cm. in diameter is essentially malignant and, to say the least, we must so treat it.

One of the most satisfactory procedures in gastric ulcer, particularly that of the lesser curvature, is the destruction of the ulcer by the Balfour cautery method. The suggestion I have made is that while it was common as a therapeutic measure it was not quite so common from the diagnostic standpoint and my slight modification of the method is to excise the ulcer and examine it microscopically then and there. Excise it with the cautery knife if you choose, but do not destroy the pathological evidence by the cautery. Preserve the specimen, do the same operation, then close it over and later do a gastro-enterostomy independently.

The lesions of the lesser curvature are very satisfactory to treat. When we consider, however, the prepyloric ulcers, nothing short of excision is necessary. The resection of the stomach that was primarily planned is still the operation of choice.

Gastro-enterologists who do not operate themselves must absolve the Amercian surgeons from the fallacy of the popular Continental idea of resecting the stomach widely for duodenal ulcer. Very few of them have been swept off their feet by that propaganda. Some of the Europeans have become very expert. Their reasoning is intriguing and the theory of removing the acid part of the stomach is all right, but the practice of removing one-third of the stomach for a duodenal ulcer is bad surgery. Funister was good enough to come to Vanderbilt University and perform one of these operations. There was no cancer, but there was alkaline secretion in great excess; but since we were in the stomach, we should not forget the possibility of cancer. It is a moot point whether the condition goes on to an ulcer.

Seventeen years ago the pathologist at the Rochester Clinic suggested that most cancers were on an ulcer base. Studies since then have not proven this to be true. I wish it were true, for it might give us hope for a cure of cancer of the stomach. What will you do for a man 69 years of age who twelve days ago began vomiting? An x-ray showed complete obstruction. He was vomiting kidney beans that he had eaten two weeks before. You operate for obstruction and find perhaps a very far advanced cancer of the stomach. You wish he had had an ulcer history for fourteen years. Then we would have had something to go on. Probably not over 10 to 15 per cent of cases could be demonstrated to be due to ulcer at the present time.

Gastric ulcer should be treated as though it were cancer.

CERTAIN ASPECTS OF THE AFTER-CARE OF THE NEWLY-BORN*†

By L. R. DeBuys, B.S., M.D.,
New Orleans, La.

Each period of life has its individual problems, and there is no doubt that each one has received a considerable amount of thought and study. There are two, however, which have been neglected to a very great degree. They are the neo-natal period and the period of the pre-school child. The latter with its problems of infectious diseases is rapidly coming into its own. The period of the newly-born has not been so fortunate. Incidentally there is no period of life where greater alertness and the exercise of correct judgment are more essential.

There is so much to be said concerning this time of life that many hours of lectures could be consumed in order to cover the subject. Today I will simply refer to certain of the problems which confront us and to emphasize some "do's" and "don'ts." In general the problems may be considered under the following five headings, and the few remarks I wish to make regarding each of these will be included thereunder: (1) the prevention of injury; (2) the diseases of the newly-born; and the three great problems of life, (3) maintenance of body temperature, (4) prevention of infection, and (5) feeding.

First, let me define the period of the newly-born. It is that period of life which begins with the tying of the cord of the living infant and ends when he is one month old. I do this in order that my remarks may not be construed as a criticism of our closest co-worker, the obstetrician, may God bless him, for he undoubtedly has his burdens, and I certainly do not envy him in his responsibilities. Nor do I wish to attempt to dictate who is to assume the responsibilities of the life of the newly-born. Whoever he may be, let him make a careful study of the problems which arise at this period of life.

Do not let him assume the attitude of one man, an obstetrician, who remarked to me when an infant was five days old: "When I looked at the kid this morning I told the father it was very sick and that he had better call a baby specialist. You know, Doctor, I don't monkey with them when they get sick." The baby died within twenty-four hours after the father had been informed of its illness. A typical pneumonia existed, which was shown by physical examination, blood findings and radiologic confirmation. The disease was not in its inception, either.

Here let me say that there are 300,000 lives lost annually in the first year of life, of which 150,000 have been shown to be due to preventable causes and 100,000 to occur within the first month of life.

Prevention and prompt recognition of abnormal situations are essential at this period of life. In my opinion the beginning of the period of the newly-born marks the beginning of the responsibility of the pediatrician. Incidentally it has been my pleasure to count many excellent obstetricians among my very good friends, and it was because of the broad-mindedness and progressive attitude of my good friend, Dr. J. W. Newman, obstetrician at the Touro Infirmary, that my work in the development of my service of the newly-born was facilitated.

First Problem, Prevention of Injury.—When one realizes the tremendous force of the pains of labor and the delicate parts of the baby which must inevitably yield to these forces, it is truly remarkable that the casualities of life are not greater. Let me here interpolate that the obstetrician should not be made the goat of all cases of birth injury, particularly of the birth palsies. For I have seen many such cases occur with multiparous women in precipitate deliveries. If they can occur in this way, they certainly can occur independently during careful delivery, even though it be instrumental. Undoubtedly, however, many of the cases of paralysis are due to faulty obstetrics.

In this problem of the "prevention of injury" I am not including the problems of the obstetrician, namely, those which occur during delivery, but those which occur beginning with the tying of the cord. I will consider the various

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†From the Service of the Newly-Born of Touro Infirmary and the Department of Pediatrics of Tulane University of Louisiana.

points I wish to emphasize as they would occur chronologically.

(1) *Tying of Cord.*—Whether it be tied long, short or sutured, it should be tied tightly and carefully: (a) because of diminishing the possibility of hemorrhage; (b) because those cords which are not tied tightly are slow in falling, leave a raw surface, and a granuloma frequently results; and (c) it should be done carefully, meaning with no pulling on the cord, as for example, allowing the hand to slip and jerk the cord. This, at least, is one of the contributing causes of umbilical hernia.

(2) In resuscitation of the infant simple methods should be employed: heat and cold in the usual ways, or the Sylvester method of artificial respiration by rhythmically pressing the arms to the side of the chest wall, and then extending them up over the head. Sometimes the method of Labarde of making rhymthmical traction upon the tongue may be additionally of value. The method of Schultz, that is, grasping the baby by both axillae and swinging it, is mentioned only to condemn it. It is spectacular stuff for which there is no excuse. These poor little infants who have already been subject to too much trauma are given a little more. In many of the cases requiring resuscitation there is some slight hemorrhage, and this method only contributes to further injury. Likewise it is harmful if there is any cardiac feebleness. The method of Dew, of holding the baby in the palms of both hands and causing respiration by flexion and extension, is less harmful.

By no means should mouth to mouth inflation of the lungs be employed. I have seen many cases of ruptured lungs and pneumonia result therefrom.

When methods of resuscitation are employed, there should be no forceps or anything hanging on the cord to pull it and cause an umbilical hernia.

While injury to the mammary gland with its resulting mastitis in the infant may be looked upon lightly in some quarters, it is really a condition which should be prevented. I now have a young mother whose breast was injured permanently in infancy by an early mastitis which was operated upon so that it has materially affected the function of her breast and has handicapped her in caring for her infant.

Knowledge and Recognition of Diseases of the Newly-Born.—Under this heading I wish to emphasize the necessity of promptness if the maximum of beneficial results is to be derived. For example, asphyxia and atelectasis require attention: not only at once, but the infant must be closely watched and made to breathe deeply not only promptly but at frequent intervals after the primary resuscitation, so that it does not lapse into its previous condition.

The hemorrhages, both traumatic and spontaneous, should be readily recognized. While it is quite true that not much can be done for the former, the latter with proper care will respond remarkably and with excellent results. The use of whole blood untyped intramuscularly and typed intraperitoneally are therapeutic measures which are truly spectacular in their effect.

Jaundice in its various types also should be early recognized, so that its origin may be discovered and immediately cared for. Those due to pyogenic infection, interstitial hepatitis and idiopathic jaundice will yield to the therapeutics of their individual causes. The jaundice due to malformation is as a rule a fatal condition, and the knowledge of its existence is of value only in so far as the prognosis is concerned.

The acute inanition seen at this period of life, if recognized, will readily respond to proper treatment, but if allowed to go uncared for may result fatally either from an uncontrollable heat center with hyperpyrexia and death or by so diminishing the resistance of the infant as to make him readily susceptible to any extraneous infection.

THREE GREAT PROBLEMS OF LIFE

Maintenance of Body Temperature.—When one appreciates that the regulation of body temperature is one of the most important problems of the newly-born, any help which might lessen his burden should be given him. When it is realized that in the adult who has a fever, the temperature may be reduced by sponging or bathing, the possibilities of the ill effects of the reduction of the baby's temperature by the initial bath ordinarily given can readily be seen. The initial bath immediately after birth only tends to make the burden of the newly-born greater. No baby should be given a bath until after it is about twenty-four hours old, and newly-borns below weight should go a longer period without the bath.

Twin boys were born in an institution in which the baths for the babies in the nursery were given in a room which had at one end a large open window and at the other end a door, thus creating a decided draught through the room. The twins weighing in the neighborhood of 3.5 and 4 pounds were bathed in this room immediately after birth and daily thereafter. Their initial weight loss was excessive, the weight curve con-

tinued downward until one of the babies died. I was called in for the second baby after it had been removed to the home. I had it immediately admitted to another institution, placed in an incubator, had it tube fed; but its loss had been so excessive that it was impossible to stem the tide. Babies of similar weight, and even much less weight with the same routine that was employed in the care of the second baby regularly, thrive in the institution to which the second baby was brought.

An application of warm olive oil is all that is necessary. Studies made in my service for the newly-born showed that without immediate bathing the temperature remained more stable, the initial loss of weight was much less than the average (being 6⅜ ounces as against 9 ounces) and the time for the return to the original birth weight was shorter than the normal (6 days as against 11 days).

Small babies should be placed in incubators (my preference is the incubator bed of Hess) at least until such a time as their temperature remains constant. Incidentally an elevated temperature of an infant in an incubator may be due to too much external heat. In the incubator the infant should have no clothes. Clothes are non-conductors of temperature and keep away the warmth from the baby. (Examples, blanket for ice in summer, overcoats for us in winter). Graduating the baby from the incubator should be gradual.

After the baby has reached the weight of 5 pounds, the baby is clothed and the hood of the incubator is removed, no other change being made in the routine of the baby, including the feeding, etc.

If it continues to gain, the entire hood is removed, and if the weight still continues on the increase, the heat in the incubator is turned off, so that the child is surrounded by the ordinary temperature of the nursery. If the baby continues to gain, it is then taken out of the incubator and placed in an ordinary crib.

A thorough knowledge of its use is necessary in the employment of the incubator.

Prevention of Infection.—It is hardly necessary to call attention to this problem, for much has been done along these lines for many years. Ophthalmia neonatorum is a rare condition in institutions at least, now. Tetanus neonatorum is likewise rare. The pyogenic diseases, however, must be guarded against. Prevention is of prime importance in connection with these diseases. Injuries to the body surface during delivery should be promptly cared for, as should bruises and impaired circulation of presenting parts.

A baby was admitted in the service with only one of its feet delivered. With a great deal of difficulty, the entire delivery was perfected, but the child's leg was distinctly ecchymotic from the calf down. Precautions were taken in the three great problems, namely: the child was placed in an incubator to assist it in maintaining its body temperature; it was properly fed, and progressed in its weight. Our greatest concern was with regard to the foot, which we feared might become gangrenous. With proper external heat, the circulation improved, the color changed from blue to pink and ultimately the baby was discharged perfectly well.

Care of the mother's nipples may prevent thrush.

The necessity for the care of the mother's nipples is emphasized in the case of twins whose mother was admitted without having had any previous care to her nipples. Both twins developed thrush and were the only children in the entire service who had the infection. The presence of the organism proved the infection.

Prophylaxis with gential violet is routine in my service. Included also in the infections must be those acquired through exposure to curious and careless visitors, friends and relatives. Cases of respiratory infections and skin infections (impetigo) may enter in this way.

A case of impetigo was discovered in a baby in the nursery whose mother was visited by another one of her children with a frank case of the same disease. All the other children in the nursery were free.

The nursery is a valuable adjunct to the obstetrical hospital. It does three things: (a) helps to prevent infection; (b) assists in giving rest and tranquility to the mother; and (c) permits the baby to be properly regulated and trained so as to spare the mother unnecessary trouble and anxiety and worry when her physician, nurse and relatives leave her.

Feeding.—With a close observation of the temperature and the daily weight; a knowledge of the normal evolution of the human breast; and a daily examination of the newly-born, besides a familiarity with the problems already referred to, the infant need not suffer any delay in his progress. It is not my purpose to advocate any special interval of feeding, but it must be emphasized that the progress of the infant is all important and he should not be allowed to become handicapped with a bad start, always remembering that he is an individual. I do wish to emphasize, however, that in those infants who are injured, ill, congenitally weak, or premature, gavage should be practiced without hesitation. In the event that gavage must be used the milk from the mother may be expressed and used. If this is not possible in my service, the milk from some other mother in the hospital may be employed. It has always been very gratifying to me to see how eager and willing the mothers in the free service are to help the babies of the private cases and vice versa.

The Abt automatic milker is indispensable in a maternity hospital. In the home, manual expression does very well. Infantile nipples and retracted nipples especially should receive proper attention during pregnancy. After delivery a knowledge of the anatomy of and the evolution of the lactating breast will facilitate the problem of breast feeding. During the seven years that my service of the newly-born has been in operation there has not been a single case of fissured nipples or caked breast and not once have ice-bags or other means had to be employed on the breast. A breast dressing which I have previously described† is regularly used with gratifying results. Mothers who have come back for subsequent confinements eagerly ask for the dressing. Others, after the dressing has been removed, request that another be applied. In only one instance has a woman stated that she did not experience any relief and her husband confidently said she was a crank.

X-RAY BURNS OF THE THROAT: REPORT OF TWO CASES*

By E. L. Posey, M.D.,
Jackson, Miss.

Two cases of x-ray burns of the throat have come under my observation during the past two years, the first and only two of the kind I have seen.

I have seen a few x-ray burns of the body, other than the throat, but in all of them there was always a destruction of the superficial parts, the skin first and then the subcutaneous structures. These lesions, as you know, heal very slowly. In the cases that I shall report, there was no open wound. The destruction was in the deeper parts. These two cases differed in that in one the patient's suffering was great and the other suffered very little after the first fifteen days following his injury. The one whose suffering was so severe had no external evidence of injury except a contraction of all parts. In the other the tissues of the neck were so badly swollen that the chin and breast were on the level with the neck.

The first case was that of a young lady, white, single, 22 years of age. Her health up to the time of this trouble had been good, except for the ordinary diseases of childhood. Fifteen months before she entered the hospital she was told by a physician that she had an exophthalmic goiter, and he advised x-ray for her ailment. She stated that she was given on an average of two treatments with the x-ray each week during these fifteen months. She stated also that these treatments lasted from ten to fifteen minutes, and were administered at times by the physician, or his son, and when neither of them could give it, the colored maid gave it to her. This patient entered the hospital complaining of difficult swallowing and breathing, and severe coughing attacks when eating or swallowing. These symptoms had been present for some time and the patient had lost considerable weight. Her temperature was 101°, respiration 24 and pulse 120. Her suffering was most excruciating.

Examination of the patient's throat revealed the following: the tongue, especially at the base, was red and had a glistening parched appearance. The arytenoids and epiglottis were very red and thick and had the appearance of cooked ham. The cords were red and swollen. The exterior of the neck showed a general contraction. Gargles, local applications and general supportive treatment were given for two weeks' time. The patient grew weaker each day, and the family physician advised that she be taken to one of the South's greatest surgeons. This was done and after observing her for a day or two this gentleman decided to do a tracheotomy. By this time there was a general sloughing of the tissues inside the throat. There was a large opening from the trachea into the esophagus. This surgeon stated to me that he had never seen such a distorted piece of anatomy, and the tissues were as if they had been cooked. The field was almost bloodless. The patient died a few days after this operation.

The second case is that of a white man, 45 years of age. This man entered the hospital on the afternoon of September 26, 1926, with the following history: his general health was good. He had had no severe illness since childhood. He denied any venereal infection. During the preceding year he had had attacks of laryngitis and at times became quite hoarse. A few days before he contracted a cold and a short while later developed an attack of laryngitis. This seemed to be the most severe attack the patient had experienced. Upon the advice of some friends he presented himself to the same physician who had treated patient No. 1, mentioned in the paper, and was given x-ray treatment for his ailment. The night following this treatment he was unable to sleep because of difficult breathing. The next morning he was given another treatment of twelve or fifteen minutes' exposure to the x-ray. This treatment aggravated the trouble and his breathing during the day and night became more difficult and labored. Shortly after the second treatment, his neck began to swell. The swelling began in and around the parotid glands and gradually met in the center of neck. The patient could not lie down. He fought for air until late in the afternoon of the next day when he came to the hospital.

Examination of the patient showed the following: the face was cyanosed, the extremities were cold and clammy. His neck was swollen to about four times its normal size. The swelling extended from the chin into the tissues below the clavicle and laterally to and including the parotid glands. (This swelling developed after the second x-ray treatment.) The mouth was red and filled with saliva. The epiglottis was markedly

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Twenty-First Annual Meeting, Memphis, Tennessee, November 14-17, 1927.

†Simple Dressing for the Breasts of the Mothers of the Newly-Born. Amer. Jour. of Dis. of Child., 33: 732-739, May 1927.

congested and the arytenoids were so swollen that nothing could be seen below them.

The urinary findings were negative. A smear and culture from the throat showed only staphylococci. A blood Wassermann was taken which later was returned negative. Blood count showed 12,000 leucocytes. The heart and lungs were negative. The patient was put in bed in the sitting posture, as he could not breathe lying down. Ice packs, gargles and opiates were given for twenty-four hours. During this time he made a most heroic fight for life. Respiration by this time had become so difficult that he was almost completely exhausted and was dying from air hunger. We decided to do a tracheotomy as the only thing that would save his life. This was a most difficult operation. His neck was short and with the large amount of swelling we had a hard and tedious task. The hemorrhage was profuse, but after about thirty minutes we succeeded in getting into the trachea. The swelling was so great that a No. 8 tube would not extend from the exterior to the trachea. We were forced to use a piece of rubber tubing for fifteen days. By this time the swelling had subsided sufficiently for us to introduce the No. 8 tube.

The first ten days were rather stormy for this man. He developed a bronchitis and for a few days it looked as though he had a pneumonia. This complication passed away, and with the subsiding of the swelling of the neck he became quite comfortable and began to recover. The neck remained swollen slightly for two months. For the first month it was necessary to change the inner tube very often on account, I think, of his bronchial trouble. He left the hospital during his sixth week and was kept in bed at home for another two weeks. He suffered very little pain after the first three weeks. We have seen him twice each week since he first came to me and the findings in his throat are now as they were when I first saw him. He goes about doing his work of contractor, but is unable to breathe without the tube. He suffers no discomfort now, except a dry feeling and occasionally some slight pain in the throat. An oily solution relieves this.

Three prominent throat men have seen this patient at my request. One suggested that we dilate the larynx, the other two thought it best not to attempt this.

During the summer two laboratories did Wassermanns upon the patient's blood and one reported a weak positive finding. The other reports were negative. I decided that a course of arsphenamin injections would do no harm, and if there were a specific infection, relief might be obtained. This was given and mixed treatment, too, but so far as I can tell the patient was in no way benefited.

I do not understand the pathological condition present in his throat. I have been fearful of a sloughing, but so far there are no evidences of this. I am at a loss as to what the outcome is to be. I do not know what to tell him to expect, but I am of the opinion that he is doomed to wear this tube the remainder of his life. I believe by this time he should show signs of improvement, if there are to be any.

This patient is here and I shall be glad to have any of you examine him. He and I shall both be grateful if you can offer anything that will help him.

DISCUSSION (*Abstract*)

Dr. R. C. Lynch, New Orleans, La.—In my opinion if we could find the man responsible for these x-ray treatments, he should be put in jail.

Surely the patient who is living and now has stenosis of the larynx as a result of x-ray applications, ought not to have any manipulations of his larynx of any kind within three years, for it will take all of that time for the collateral circulation to develop in sufficent degree to allow whatever procedure may be necessary to reestablish the pathway through the trachea and larynx. At best the probabilities are that the manipulations necessary to bring about a patent pathway from the mouth into the trachea will be associated with sloughing to a greater or less degree. I do not know any type of tissue which undergoes more rapid sloughing and breaking down than tissue which has been subjected to x-ray or radium. It certainly is best to keep hands off these patients absolutely for a period of from three to five years, at least, until the tissue has lost the characteristic cartilaginous harness which is natural in cases that have been burned severely by either radium or x-ray. These cases never come back to their previous normal nutritive condition, and when sloughing starts in tissue of that type it is likely to be entirely destroyed. I have had my experience in this line with a patient who had had a radium burn in an effort to clear up carcinoma of the larynx. In the instances where I did a laryngectomy following the application of radium, the tissue sloughed as in a spreading gangrene, and in one instance reported many years ago there was sloughing of the internal jugular vein.

Dr. George E. Adkins, Jackson, Miss.—The x-ray has not been used enough for us to know its ultimate effects. We do not know what Dr. Posey's patient is coming to ten, fifteen or twenty years from now.

I know the physician who gave the x-ray treatments in Dr. Posey's cases. He is a member of the Southern Medical Association and is in attendance now. Perhaps this Section will be surprised to know that the *Journal of the Southern Medical Association* bears him out in his treatment. If you go over to the Section on Radiology, you will have it pounded into you that the radiologist can take out tonsils much better than we. Practically every man who has a little x-ray outfit is trying to remove tonsils, and I know a number of men who have even resorted to diathermy for taking them out.

Dr. J. A. Stucky, Lexington, Ky.—Within the past two or three years the results which I have seen in four cases in which after consultation it was decided to use the deep x-ray treatment were so unsatisfactory that I have become decidedly pessimistic as to its value in malignancy of the nasal or pharyngeal cavities. The first case I diagnosed as osteo-sarcoma of the nasal surface of the right superior maxillary. Three deep x-ray treatments were given and at the end of five weeks I saw the patient. She had been in almost constant pain since the last treatment three weeks before. The soft tissue of the right side of the face and nose extending upward and involving the lower eyelid was hard and dry, gangrenous disintegration was beginning, and ten days later the patient died.

The second case was sarcoma of the right tonsil. Deep x-ray was used and in three weeks after the last treatment (which was two months after I first saw the patient) the sloughing mass involved the carotid artery, causing a rapid and tragic ending.

These two cases and two others, with results not so tragic, but very disappointing, have made me decidedly pessimistic and I will probably remain so until the technic and dosage is more standardized than it now is.

THE GREATEST MACHINE*

By J. R. GARNER, M.D.,†
Atlanta, Ga.

In railways, as in other industries, all machinery and equipment necessary to maintenance and operation have been inspected with the utmost care at the time of purchase and are regularly tested as long as they are maintained in service. Perfection at the beginning and the early detection of any latent defects manifesting themselves during usage are thus made certain. Daily every mile of railroad track throughout this vast country is subjected to inspection. It must be safe for the high speed of the ponderous locomotives which closely unite our civic centers, rendering possible the vast commerce in which our nation is engaged. The locomotive itself is not permitted to start upon any journey without first having been thoroughly inspected to make sure that it is in perfect working condition. No train leaves a terminus until there has been an examination of its trucks and other equipment and a test of air brakes. Hardly do the wheels cease to turn before a corps of employes is once more inspecting, making sure that all is as it should be. It would not be fair to the public who depend upon the railways for the safe transportation of both themselves and their properties to have it otherwise.

This, then, being true of the inanimate factors concerned, should not even a greater degree of diligence be required with regard to that greatest of all machines, the human being, into whose hands and under whose direction the inspections, examinations and operations of trains is entrusted.

There is no machine more complicated and none in which the perfect coordination of its intricate parts is more essential than in the human mechanism.

It is obvious that for the varied performances connected with railroad duties only men known to be physically fit should be selected. For such selection dependence must be placed upon the medical profession. Our duty, however, does not cease with examining the applicant for employment, but by frequent re-examinations we should ever be on the alert to detect the advent or development of systemic defects which, if not corrected, might lead to disruption of harmonious function and disastrous results. Not only must the man himself be considered, but every condition affecting his physical and mental being must be given careful and detailed consideration.

It would not be possible in a single address to cover each and every phase of the various conditions which might be the means of lessening the efficiency of this, the greatest of all machines. Attention will be directed only to the most salient features.

Those engaged in train operations will be the subject of our main consideration, but let us first touch upon that vast army of employes who constitute our clerical forces and to whom little, if any, attention has been given in the past.

As they are usually confined during the working hours of the day, care should be exerted to see that comfortable working quarters with adequate light and ventilation are provided, and to prevent the dissemination of contagious diseases. No known tuberculous subject should be employed, and any one developing the disease should at once be removed. There should be no compromise with this condition, as the hazard for other employes is too great. With regard to the other contagious and infectious diseases, employes exposed to them should be quarantined so long as the danger of transmission exists.

Until quite recently the question of posture has been brought to apply almost exclusively to school children. Little thought has been given to the adult whose employment requires that he be seated for many hours each day at a desk, or before some form of machine, without any consideration having been directed toward his manner of seating, or the adaptability of his chair or stool to his physical requirements. In a timely address delivered at Atlantic City by Dr. Wade Wright, of New York, within the past month, the typical young office worker was pictured as having "a poor carriage, flat chest, and prominent abdomen." Had proper attention been directed to posture, such conditions could not exist.

For one spending the largest part of the working day seated before a desk, typewriter, telegraph instrument, or any other machine or device, the ordinary chair is as unsuitable as would be a full dress suit for swimming. Such chairs are constructed without view to comfort or to conformity with the anatomical relations of the body.

One who would accomplish his daily task with the utmost of efficiency must necessarily

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†Chief Surgeon Atlanta & West Point Railroad Company, The Western Railway of Alabama, and Georgia Railroad.

work with a minimum of fatigue, both mental and physical. This can be accomplished only by the assumption of postures both easy and natural for his body. If possible, the worker should be enabled to forget his body so that he may concentrate upon the duties assigned to him, and a position approaching as nearly as possible the anatomical will best accomplish this.

There is no individual relationship between the height of the seat of an ordinary chair from the floor and the legs of its occupants. If it is suitable for one person, there are many others that it would not fit, and whose legs would therefore have to be placed forward or backward to compensate for the discrepancy in tall persons. Short individuals would attempt to overcome the same difficulty by hooking the heels of the shoe in the rungs of the chair, thus increasing the amount of flexion at the knee joint, and to some extent retarding circulation in the popliteal vessels. If the seat of the chair is of much depth from before back, the front edge will mechanically produce the same obstruction to circulation causing numbness and tingling in the feet and legs and perhaps even the swelling of feets and ankles. In order to overcome this pressure in the popliteal region, the worker subconsciously slides forward in the seat, throwing the entire spine out of alignment and bringing the weight of the body to rest with more or less pressure exerted directly on the coccyx. The natural concavity of the lumbosacral region is either obliterated or actually converted into a convexity, while the natural convexity of the thoracic region is accentuated and the line of gravity for the body thrown completely out of normal. This accounts for the "poor carriage, flat chest and prominent abdomen" described by Dr. Wright.

In such an abnormal and unanatomical position the cubical size of the chest is diminished, the lung function reduced, the blood supplied with less oxygen, the abdominal organs pressed upon and protruded forward, and the pelvic organs of the female subjected to undue and more or less constant pressure. The result is languidness, yawning, easy and rapid fatiguing, and general inactivity and incompetence, followed by permanent changes in the contour of the spine, the shape of the chest, the position and normal suspension of the abdominal viscera and, in the female, gynecological complications.

A properly constructed chair should have a seat approximately 16 inches in width, and not more than 11 inches from before back, and adjustable as to height from the floor. The back should not exceed five inches in breadth, should be adjustable so as to provide support at the junction of the dorsal and lumbar region where it is properly required, and should never extend downward to make contact with the rear edge of the seat. In such a chair the worker assumes a position very nearly anatomical with the weight of the body resting upon the tuber ischii and sustained by the vasti muscles, while the coccyx extending beyond the rear edge of the seat is not subjected to pressure, and the spine is held in correct position, permitting full play of the lungs, and undue pressure upon the abdominal organs is obviated.

Posture is deserving of far more consideration than it has been accorded in the past.

Directing consideration toward those persons whose duties are connected with train operations, it should be noted that this class includes not only engine and trainmen themselves, but signalmen, towermen, dispatchers and all directly or indirectly connected with this branch of the service.

The American Railway Association has adopted a standard of physical requirements applicable to all seeking employment in train service.

Examining surgeons should thoroughly familiarize themselves with these physical standards. The responsibility for prevention of entrance into the service of any person or persons not physically fit devolves upon them.

Many enter railway service in a physically fit condition and later develop physical and constitutional ailments which, if detected early, may be corrected, or at least controlled to such an extent that the worker's usefulness will be prolonged and he may be retained in service. Here a grave responsibility rests upon the railroad surgeon, as failure to recognize these conditions in their incipiency will ultimately result in complete destruction of the employe's manpower.

The scope of this article can touch only upon the more salient maladies influencing and affecting man-power.

MALARIA

There is probably no single disease that has affected so many railway employes as malaria. Certain sections of the South have probably suffered most from the ravages of this disease, but no section is completely free, and only during the past year an outbreak of considerable seriousness was noted in the southern part of

Illinois. The United States Public Health Service and the several state boards of health have the matter of malaria prevention fairly well in hand and are being rendered very valuable assistance by the railways. Once an employe is infected with malaria his man-power is diminished until he is freed from it. The number of working days lost during a single year by employes on account of malaria is stupendous. The eradication of infection in malaria sufferers rests with the medical profession.

EPILEPSY

There are two separate and distinct classifications of epilepsy: primary or idiopathic epilepsy and secondary epilepsies. As a momentary loss of consciousness in an employe entrusted with the execution of some important duty or order connected with train operations might result in a disastrous calamity, an epileptic, constantly subjected to a seizure, is a grave menace to the railroad.

Occasionally an epileptic subject may pass physical examination without detection of his malady, for in the majority of cases, particularly among young adults, no objective symptoms are detectable between attacks. The examining surgeon should therefore inquire very closely as to loss of consciousness or any type of convulsive seizures upon the part of the applicant. No applicant having a history of an epileptic seizure, or of a condition which might even be suggestive of epilepsy, should be admitted to the service.

Employes who manifest epileptic or epileptiform seizures should at once be removed from train service and an effort should be made to determine whether or not the condition is idiopathic or secondary. If differentiation is not possible, all doubtful cases should be classed as idiopathic and, together with those known to be idiopathic, should be permanently removed from any service directly or indirectly connected with train operations.

In those suffering from secondary epilepsies, an exception to permanent removal from service may occasionally be made when the cause has been ascertained to be a benign and nonspecific tumor of the brain, or some form of head injury, and when proper surgical means for correction have been resorted to, followed by a sufficient length of time, not less than two years, to render the assumption of non-recurrence reasonably safe.

Any period of unconsciousness manifested by a railroad employe should be considered as at least suggestive of epilepsy and dealt with accordingly until it is definitely established to be due to another cause.

DIABETES

Urinalysis is important in the examination of applicants for employment and in all re-examinations. No diabetic is employable. Detection of the diabetic subject among train men is of particular importance owing to the sudden onsets of coma to which he is subject and which endanger not alone the employe's life but the lives of his fellow employes and the public.

Any train employe known to be diabetic should be kept under regular and frequent observation, and should he show an increasing amount of sugar, or manifest any serious symptoms, he should be removed from service until the condition is improved. Any diabetic unable to control his sugar output by diet and requiring insulin should be considered as dangerous for train service during such administration. Severe cases of insulin reaction have been noted and in a trainman this would constitute as grave a menace as the disease itself.

Sight should not be lost of the fact that trivial injuries, particularly to the feet, sustained by diabetic persons are very likely to lead to a prolonged disability. Consequently any wound failing to heal in a reasonable time should be an indication for urinalysis and for the suspicion of diabetes.

A strong effort has recently been made to determine, if possible, just how many milligrams of blood sugar per cubic centimeter may be tolerated in a diabetic employe without disqualifying him for train service. Letters were written to large clinics and to physicians throughout the country known to treat large numbers of diabetic patients, with intent to secure their view on this important topic. While various estimates ranging from 200 to 300 mgs. of plasma sugar were received, the preponderance of evidence is strongly against the advisability of attempting the fixation of any definite safe level for blood sugar beyond which there is danger.

CARDIOVASCULAR-RENAL DISEASE

It is not believed that the railroad employe is more likely to become afflicted with that syndrome complex known as cardiovascular-renal disease than are men in any other walk of life. But if he is so afflicted the duties of his occupation subject him to both physical and mental strain. The uncontrollable exposure to which he is subjected and the irregularities, both as to diet and rest, will have a natural tendency toward aggravation of his troubles.

Apparently there is a prevailing impression that the constant jarring of an engine is an etiological factor in the production of kidney disease among locomotive engineers. This was the subject of an exhaustive study of a committee from the Surgical Section of the American Railway Association. Based upon a careful review of all available information, the conclusion was reached that diseases of the kidney must arise from causes within the patient, and not from without, and therefore that the jarring of the engine could not be considered as an etiological factor in such cases.

Blood pressure is the most dependable indication of the condition of a cardiovascular-renal patient. While it is difficult to fix an exact figure beyond which danger lies, it is a safe practice to consider any employe with a systolic pressure of over 175 mm. as bordering on the danger line and he should be kept under frequent observation. A systolic blood pressure of 200 mm. or over should disqualify for train service.

Careful study of the situation indicates that two little attention has been paid to the diastolic pressure in cardiovascular-renal subjects. Some have placed the limit of safety at 125 mm., but it is extremely doubtful that so high a diastolic reading is permissible in train service employes.

The railroad surgeon should constantly be on the alert for any indication of cardiovascular-renal disturbance while treating injured parties, even for what may apparently be a minor injury, and any such symptoms detected should be included in his report to the chief surgeon. Advanced aortic lesions, definite myocarditis, heart block, aneurysm, or angina pectoris, are conditions associated with too great danger to be tolerated in persons entrusted with train operation.

SYPHILIS

Without doubt, syphilis is the greatest menace attacking the man-power of our American railroads. This does not mean that the railroad man is more frequently infected with the disease than the public in general, but there is no class of men in whom the ravages of syphilis play so great a part in disqualifying, both mentally and physically, for the duties of their occupation as the class engaged in train service. Daily the safe transportation of thousands of passengers and the handling of millions of dollars in property is dependent upon the functioning of both their minds and bodies. Any disease with such far-reaching devastations and ofttimes insidious and sudden manifestations must be considered of grave moment in such employes. It therefore becomes our duty to lend our efforts to the eradication of the disease among our employes. This can best be accomplished by, first, disqualifying all applicants for employment who are infected; and second, by recognizing the disease in those already in service and insisting upon prompt, efficient and sufficiently prolonged treatment to effect a cure, or at least to prevent the otherwise impending doom.

Various writers have maintained that of the adult population between 10 and 15 per cent are syphilitically infected. The survey of a special study made with regard to railway employes develops the fact that in this particular class of men the luetics were found not to exceed 5 per cent. This situation is probably attributable to the rejection of applicants for employment who upon physical examination are found to have syphilis and to the early detection of the disease in those already employed during the periodic re-examinations required on many railroads.

One recent observer, who made a detailed study of fifty railway employes known to be luetics, found that sixteen were engineers, twenty-one engaged in other forms of train service, and the remaining thirteen were yard foremen, telegraphers, section hands, and so forth. Accepting these figures to be fairly representative, they show conclusively that, even though railway employes do not manifest so high a percentage of infection as is ascribed to the general adult population, the disease is unquestionably found with sufficient prevalence to constitute a very serious menace and demand critical attention at the hands of the surgical departments.

As applicants for employment found to have had a syphilitic infection are to be considered as disqualified for railroad service, our interest will naturally center upon those already employed and in whom the infection was not detected when they were admitted to the service, or to those who have contracted the disease since employment.

The great danger in a primary or an early syphilis is the likelihood of its transmission to fellow employes, and the only too well known tendency on the part of many patients to discontinue treatment as soon as they no longer have ocular evidences of the disease. A great responsibility devolves upon us when a syphilitic patient presents himself for treatment as a private case, or when we treat an injured employe on behalf of the company, to note the existence of the disease. First and foremost it becomes the surgeon's duty to convince the patient that instead of condemnation he will have the sym-

pathy and assistance of his employers if he will only cooperate and do his part by complying with the necessary requirements of proper treatment and exercising every precaution to prevent the infection of others. His position should never be in jeopardy so long as he is endeavoring to relieve the situation, and if the disease has not progressed to such a stage as to render him a dangerous subject either to himself or the public. Needless to state, every patient with the disease in a stage of active transmissibility should be temporarily relieved from service until such time as he may be safely considered non-infectious. Such a quarantine would apply with equal force in case of any contagious or infectious disease and should give no offense to the sufferer.

Obviously it is the remote manifestations that occasion greatest concern among railroad workers. Generally syphilitics acquire their infection before the twenty-fifth year of life. When this has occurred within recent years and the case has been adequately treated, a cure may reasonably be expected and no remote or late sequelae contemplated. However, if the infection was acquired before the advent of the Wassermann and other laboratory tests, and introduction of the arsphenamin, together with mercurials for hypodermic administration, the picture presented will be entirely different. After having pursued the prescribed treatment of mercury and potassium iodid for a period of three years, and with the absence of symptoms, a luetic may honestly have believed himself cured. Many of us were taught that following such a course of treatment we might consider as cured any patient presenting no manifestations.

Today we know the fallacy of such an attitude with respect to treatment as formerly prescribed. Late accidents of syphilis as a rule occur between the fifteenth and twenty-fifth year following the primary infection. This refers especially to cases that have now reached these periods after infection, for it appears to be a peculiar phenomenon that among patients infected in more recent years and treated by our modern methods these catastrophes develop at a much earlier date if they are to appear at all. This long period between primary infection and the neuro-syphilitic manifestation is of particular importance to railroads where the employe, who as a young man held a position of only minor consequence, has through his application and labor risen to one of responsibility and trust and whose years of experience make him invaluable. If the employe in one of these higher positions becomes a victim of neuro-syphilis and suddenly manifests some catastrophe of the condition, the lives of his fellow workers and patrons of the company are endangered as well as his own.

Careful observation and study leads to the belief that with cooperation on the part of company surgeons and oculists no less than 45 or 50 per cent of all syphilitics in railway service may be detected by simple observation of the eyes, gait, tremor, reflexes and so forth before the condition has progressed so far as to render the patient unfit for service or beyond the hope of medical aid.

For these reasons surgeons making examinations of employes should note carefully the following in addition to other routine measures:

(1) Gait of applicant; (2) Romberg and knee reflexes; (3) the extended arms for tremor; (4) general adenitis; (5) evidences of a primary lesion; and (6) puncture marks in the flexure of the elbow joints, indicating intravenous administrations.

The oculist should give special attention to the following points with regard to the pupils: (1) reaction to light; (2) irregularities; (3) size and equality; and (4) Argyll-Robertson pupil.

Any of the above symptoms, if found, should be specifically noted on the surgeon's report of examination and such patients should be advised to place themselves under proper treatment and continue it for a sufficient period of time reasonably to promise a cure. All such persons should be subjected to periodical and frequent re-examinations. Such a person should not be considered as out of danger until both the blood and spinal fluid have responded negatively to the Wassermann, or a similar test.

In the foregoing, my effort has been to impress upon you the fact that of all machines the human is the greatest; that the defects arising in the human body may be the means not only of disrupting its own coordination but also of producing complication in the workings of the inanimate machine that may result in disastrous consequences. Time has permitted me to touch upon only the high points of the more serious conditions and diseases affecting the railway employes. My hope has been to bring before the attention of railway surgeons their great responsibility in detecting these conditions, correcting them in so far as possible, and in cooperating with the surgical departments of the railways in the selection and maintenance of an efficient human factor.

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EDITORIAL DEPARTMENT

ESTRIN

Ovarian extracts on the market in the past have not been uniformly active, and ovarian therapy has fallen into some disrepute because of the uncertainty of its effects. It has been difficult to standardize the commercial extracts and to determine their actual potency. Newer methods of standardization are apparently about to yield a more definitely effective product.[1] According to certain authors, much of the difficulty of securing a uniform extract has been due to the fact that cyclic changes of the ovary were not taken into consideration. Ovaries at any period of the sexual cycle, with corpora lutea, early follicles, or mature, were used for preparation of medicaments. Allen and Doisy[2 3] have described an extract obtained from ripened graafian follicles of pigs at a certain stage in the cycle and at no other stage, which on subcutaneous injection into spayed rats regularly induces the characteristic phenomena of estrus, or heat. None of the commercial extracts which they examined exhibited this property. The active extract was called estrin, and since extracts from the graafian follicles of hogs or cattle were found to be active upon rats and other animals, the substance was considered common to all females, not specific for a given species.

In animals the phenomena of estrus seem to be analogous to the menstrual cycle in the human female, and like this to depend upon the normal activity of the ovary. Menstruation and estrus are alike permanently abolished by extirpation of the ovaries, but may be reinduced by implantation in the peritoneum of ovarian tissue from another animal of the same species. The demonstration of estrus in an animal without ovaries after injection of small quantities of an ovarian extract would indicate the presence of a substance of great biological significance. Its alternate presence and absence in the circulation could explain in animals the coming on of heat.

During estrus in rodents the type of cells in the vagina is of one kind, cornified epithelial, and a characteristic cyclic variation of the vaginal cells has been shown, so that from examination of a vaginal smear the estrual period may be definitely determined.[4] Allen and Doisy use this fact to test and standardize their follicular extract. The quantity necessary to bring on estrus in a spayed animal in a given time is taken as a unit. They have purified their extract to some extent, using this test to measure its activity, and have separated it from many inert materials. Their purest product was thermostabile, contained about 80 per cent carbon, 10 per cent hydrogen, and nearly 1 per cent nitrogen. It was soluble in fat solvents and practically free from cholesterol.[5]

If estrin be given to immature animals, it will rapidly bring on puberty.[2] In the very early stages of pregnancy it will induce abortion.[6] Extraction of the hormone from the placenta and other tissues has been claimed.[7]

A probably identical substance with the property of throwing spayed mice into estrus has been obtained from the blood of women by Frank and his coworkers.[8] It is present from three to ten days before menstruation, vanishes usually with the onset of the menses, and may be found in the menstrual blood. It disappears from the circulation, according to these authors,

1. Dixon, W. E.: Action and Uses of Ovarian Extract. Brit. Med. Jour., 3492:1070, Dec. 10, 1927.
2. Allen, Edgar; and Doisy, E. A.: An Ovarian Hormone. J. A. M. A., 81:819, 1923.
3. Allen, Edgar; Doisy, E. A.; Francis, B. F.; Gibson, H. C.; Robertson, L. L.; Colgate, C. E.; Kountz, W. B.; and Johnston, C. G.: Hormone of Ovarian Follicle: Action in Test Animals. Amer. Jour. Physiol., 68:138, 1924.
4. Stockard, C. R.; and Papanicolaou, G. N.: Existence of a Typical Gastrous Cycle in the Guinea Pig. Amer. Jour. Anat., 22:225, 1917. Quoted by 2.
5. Ralls, J. O.; Jordan, C. N.; and Doisy, E. A.: Improved Procedure for Extraction of Ovarian Hormone and Some Chemical Properties of Product. Jour. Biol. Chem., 69:357, 1926.
6. Smith, M. G.: On the Interruption of Pregnancy in the Rat by Injection of Ovarian Follicular Extract. Bull. Johns Hop. Hosp., 39:203, 1926.
7. Dickens, F.; Dodds, E. C.; and Brinkworth, D. J. T.: Ovarian Hormone. Lancet, 1:1015, 1927.
8. Frank, Robert; and Gustavson, R. G.: Female Sex Hormone. J. A. M. A., 84:1715, 1925. Frank, R. T.; and Goldberger, M. A.: Female Sex Hormone. J. A. M. A., 87:554, 1926. Ibid., 87:1719, 1926. Ibid., 86:1686, 1926.

early in pregnancy and reappears after the twelfth week in all normal cases. Its absence after the twelfth week, they say, denotes a pathological condition. It is the presence of this substance in the circulating blood of women that causes the prodromal symptoms of menstruation, the turgescence of the breasts and preparation of the uterin lining. Recognition of its presence or absence should be of value in menstrual disturbances, and, they suggest, in establishing the sex of an hermaphrodite.

The pharmacological use of estrin, now in dispute, will eventually be established. It may in the future stand with pituitrin, epinephrin, insulin, thyroid and liver extracts: biological extractives a few decades ago unknown, small quantities of which have powerful and peculiar effects upon animal and human function.

URINE CHANGES IN EPILEPSY

Fasting was first suggested to improve the status of epileptics, and during fasts it was observed that epileptic attacks were few. Since this might be due to the acidosis of fasting, and since it was obviously impossible to treat epileptics indefinitely by fasting them, the ketone-producing, or high fat, diet was introduced. A drift toward abnormal alkalinity preceding epileptic attacks has been claimed. Physicians who have treated epileptic children by advising a high fat diet have reported improvement of the condition in about one-fourth the cases. Reduction of the number of seizures, normal maintenance and growth of children on a diet in which ketones, usually considered indicative of acidosis, were regularly present in the urine, have been reported. However, it should be remembered that the most extensive experiments upon the subject conducted at the New Jersey State Village for Epileptics showed no effect of any diet upon the course of epilepsy.[1]

Gamble and Hamilton[2] have made extended studies upon the composition of the urine of an epileptic child, with the view of ascertaining whether there is a drift to abnormal alkalinity preceding epileptic seizures. A disturbance of the neutrality regulating mechanism of the body, they concluded, should produce irregularities in the acid-base composition of the urine. An epileptic girl of eleven upon a constant diet and fluid intake, whose seizures occurred with sufficient regularity to be foretold, was observed. The volume, titrable acidity, hydrogen ion concentration, organic acids, inorganic sulphates, phosphates, chlorin, ammonia and total fixed base of the urine during a period of hospitalization were studied.

Changes were noted in several factors during the seizures. The total acid and total base of the urine increased equivalently. The daily volume increased. The urine acidity and ammonia were stationary. There was a loss of extracellular body fluid during the epileptic attacks. Alkalosis was not demonstrated preceding the attacks in this one child. There seemed to be a change in body fluid volume rather than in body fluid reaction.

Bethea,[3] in the JOURNAL, has reported a roentgenological study of the intestinal tract of four hundred epileptics. Five-hour gastric retention and a peculiar spastic and serrated appearance of the intestines was characteristic of a large proportion of his cases. Eventually epilepsy may be shown like many other diseases to originate in the alimentary tract.

1. Editorial, Ketosis for Epilepsy. The JOURNAL, 20:252, 1927.
2. Gamble, J. L.; and Hamilton, Bengt: Acid-Base Composition of Urine from An Epileptic Child. Johns Hop. Hosp. Bull., 41:389, Dec. 1927.

EXPERIMENTAL PRODUCTION OF BLADDER STONE

It has been variously shown that cod liver oil and ultra-violet light increase the acidity of rat feces. Sunshine upon a rachitic rat has the same effect.[1] In rickets, there is a mild tendency to alkalosis in the rat or dog's[2] intestinal tract: the intestines are less acid than normal, may even become alkaline, and the acidity of the feces increases with anti-rachitic treatment.

It has been suggested that this is an important factor in explaining the deficient calcium and phosphorus assimilation of rickets. These elements are more soluble in a more acid medium, and less soluble as the acidity of the intestines decreases. Therefore, they are less readily absorbed into the blood from the intestine of the rachitic animal.

Stone in the bladder[3] and kidney[4] have been experimentally produced by a diet deficient in

3. Bethea, W. R.: Gastro-Intestinal Study of Four Hundred Epileptics. S. M. J., 20:430, 1927.
1. Tisdale, F. F.; and Price, H. W.: Effect of Sunshine on the Acidity of the Intestinal Tract of Rachitic Rats. Johns Hop. Hosp. Bull., 41:432, Dec. 1927.
2. Grayzel, D. M.; and Miller, E. G., Jr.: Concentration of Intestinal Contents of Dog, with Special Reference to Inorganic Metabolism. Proc. Soc. Exp. Biol. and Med., 24:668, April 1927.

vitamins A and D. About 30 per cent[3] of a set of rats on this diet developed stone or gravel, or both, in the bladder, usually with cystitis, in from sixty-six to one hundred and fifty days. Three showed hematuria and severe anemia. Another group which received the same diet with the addition of whole milk showed neither stone nor other abnormality of the urinary tract at post-mortem.[5]

The animals which developed stone were on a diet so highly deficient that it would hardly be the ration of a human being. The experiments merely indicate that it is possible to produce bladder stone through diet with no other apparent contributing factor.

If there is an alteration in the acid-base relation in the intestinal tract in rickets, there are probably comparable acid-base disturbances in other tissues, for instance in the bladder and kidney walls, which may interfere with normal phosphorus and calcium excretion and favor stone formation. A mildly rachitic diet is not uncommonly chosen for daily consumption by an average American.

In handling cases of urinary calculus, it may be the part of wisdom to inquire whether the patient consumes, or has in the past consumed, adequate quantities of milk, cream, butter and cod liver oil, fresh fruits and vegetables.

Book Reviews

The Treatment of Fractures: With Notes Upon a Few Common Dislocations. By Charles L. Scudder, M.D., Consulting Surgeon to the Massachusetts General Hospital; formerly Assistant Professor of Surgery at the Harvard Medical School. Tenth edition, revised. Octavo volume of 1240 pages, with 2027 illustrations. Philadelphia and London: W. B. Saunders Co. Polished buckram, $12.00 net.

Scudder's "Fractures" has long been a favorite textbook of students and an indispensable reference work for surgeons. The present tenth edition is based upon the many years of experience of its author, who, as assistant professor of surgery at Harvard, was a famous teacher of fractures; and as a member of the staff at the Massachusetts General Hospital, presided over a large service. Later on, the well-known special fracture service was instituted by the hospital, prominent among whose workers has been Dr. Scudder.

This edition omits many obsolete methods which were in use before the World War, and which have too long cluttered up the pages of fracture texts. Free use is made of photographs and skiagraphs of actual cases, both of which add clinical value and interest to the text.

A Textbook of Clinical Neurology. By Israel S. Wechsler, M.D., Assistant Professor of Clinical Neurology, Columbia University, New York; Attending Neurologist, the Montefiore Hospital, New York. Octavo volume of 725 pages, with 127 illustrations. Philadelphia and London: W. B. Saunders Co., 1927. Cloth, $7.00.

As the title would indicate, this is primarily a textbook of clinical neurology as contrasted with the older works which stressed the anatomical, physiological and pathological sections to the point of restricting free consideration of the clinical features. Wechsler does not ignore the underlying basic sciences, but he emphasizes the bedside symptoms and signs. To use the author's words, "This work is based mainly on personal teaching and clinical experience, representing in a great measure an individual approach to bedside neurology, and . . . the personal touch will make up for many of its omissions and defects."

The need of, and the method of obtaining, a systematic history of the case and a thorough examination, are rightly stressed. It is not elaborate enough for a reference work, but is a splendid textbook for student and practitioner, which is the object sought.

A Manual of Pharmacology and Its Application to Therapeutics and Toxicology. By Thorald Sollmann, M.D., Professor of Pharmacology and Materia Medica in the School of Medicine of Western Reserve University, Cleveland. Third edition, entirely reset. 1184 pages. Philadelphia and London: W. B. Saunders Co. Cloth, $7.50 net.

The present edition has been brought up to date and completely revised. As a textbook for students and reference for physicians, it will fulfill a useful purpose. The space allotted to individual drugs is well balanced. An extensive bibliography is added.

The Tongue and Its Diseases. By Duncan C. L. Fitzwilliams, C.M.G., M.D., Ch.M., F.R.C.S. (Edin. and Eng.), Surgeon and Lecturer on Surgery to St. Mary's Hospital, Paddington Green Children's Hospital and Mount Vernon Hospital. 498 pages, illustrated. New York: Oxford University Press. Cloth, $11.00.

Modern clinicians have a tendency to undervalue the practice of lingual inspection and palpation, which formed such an important part in the routine medical examinations of the previous generation. This treatise on the tongue and its diseases will do much to swing the pendulum of medical thought and practice back to the proper consideration of this organ. As the French say in an ancient proverb: "La mort entre par la bouche."

Beginning with the anatomy of the tongue, the author continues to discuss developmental errors, injuries and wounds, acute and chronic inflammatory conditions, leukoplakia, ranula, dermoid cysts, thyreoglossal tumors, benign lingual tumors, sarcoma and finally carcinoma of the tongue.

In one interesting chapter, the appearance of the tongue in various systemic diseases is described. Dr. Fitzwilliams states that the tongue talks in two lan-

3. McCarrison, R.: Experimental Production of Stone in the Bladder. Brit. Med. Jour., p. 717, April 16, 1927.
4. Fijimaki: Japan Med. World, 6:2, Feb. 15, 1926. Quoted by 3.
5. McCarrison, R.: Experimental Prevention of Stone in Bladder in Rats. Brit. Med. Jour., No. 3473, p. 159, July 30, 1927.

guages and that in one it never lies, and that its evidence as an indication of health is not to be gainsaid.

The major portion of this book is rightly devoted to the consideration of lingual cancer: its etiology, diagnosis, clinical features, prognosis, operative and palliative therapy. Fourteen pages are consumed in the discussion on the prognosis of cancer, but only three pages are given to radium therapy, probably because of the inexperience of the author with this method of treatment.

The book is cleverly written in the English conversational style. The great number of brief, pertinent and well selected case histories would alone suffice to tell the story of the tongue and its diseases. On page 270, the author refers to a "girl of 34," which speaks well for the preservation of English girlhood.

Health Supervision and Medical Inspection of Schools. By Thomas D. Wood, A.M., M.D., College Physician, Advisor in Health Education, and Professor of Physical Education, Teachers College, Columbia University; Chairman of the Joint Committee on Health Problems in Education, National Education Association and American Medical Association, and Hugh Grant Rowell, A.B., M.D., Physician to the Horace Mann Schools; Lecturer and Assistant Physician, Teachers College, Columbia University; Member of Group Committee on Child Welfare and Parental Education, Teachers, College, Columbia University; Consultant, School Health Program Study, American Child Health Association; formerly Director of Health, Public Schools, New Bedford, Mass. 637 pages, illustrated. Philadelphia and London: W. B. Saunders Co. Cloth, $7.50 net.

A more or less extended program of health education and supervision is in use today throughout the public schools, boarding schools and colleges of the United States and those abroad. School health supervision is described in this volume as a "Nineteenth Century Old World development." It began in France in 1833 before the beginnings of bacteriology. A history of the spread of the movement here and abroad and detailed account of the laws dealing with it in the various states is given.

The organization, administration and cost of health supervision and the types of examination are discussed. The program of weighing and measuring, control of communicable diseases, health examinations, dental clinics, treatment of physical defects, school construction and sanitation are described. The concluding chapters deal with the care of the pre-school child, a problem which has received considerable attention recently at Columbia; and with the health of the child in industry.

This book is the only complete treatise on the subject which the reviewer has encountered. It is a most useful description of the problem from the standpoint of the physician interested in public health, as well as from the standpoint of parents, teachers and educators.

Principles and Practice of Chemotherapy With Special Reference to the Specific and General Treatment of Syphilis. By John A. Kolmer, M.D., Dr.P.H., Professor of Pathology and Bacteriology in the Graduate School of Medicine, University of Pennsylvania. 1106 pages, with 82 illustrations. Philadelphia and London: W. B. Saunders Co. Cloth, $12.00 net.

Chemotherapy is the most modern development of curative medicine, and the crowning achievement of chemotherapy is the present day treatment of syphilis. A leading pathologist and distinguished worker upon the diagnosis and treatment of syphilis, Kolmer, here discusses these subjects in detail.

He describes the general principles of chemotherapy, which began with Ehrlich; the chemotherapy of bacterial and mycotic diseases, of trypanosomal diseases, of spirochetal diseases other than syphilis, and of other protozoan and metazoan diseases. More than half the book deals with syphilis directly: its means of infection, immunity and pathology; the pharmacology and toxicology of anti-syphilitic medicaments; technic of their administration; the prophylaxis and general specific and non-specific treatment.

The many recent developments in the field are included. The chapters on anilin dyes in bacterial diseases give in detail the effect of the dye upon organism and host; upon phagocytosis in the tissues, formation of amboceptors, and body defense. However, the author is perhaps a little too optimistic about the therapeutic effects of dye compounds such as mercurochrome.

The last chapter is a summary of the criteria of cure of syphilis: clinical, serobiological and pathological. To the never failing query of the patient, "Can I be cured?" the pathologist's answer, Kolmer says, is too pessimistic, the clinician's too hopeful. He concludes that syphilis should be treated according to the best known present-day methods, since spontaneous arrest occurs in only 1 per cent of cases.

The Dental Assistant. By Emma J. McCaw, R.N., St. Petersburg, Florida. 119 pages, illustrated. St. Louis: C. V. Mosby Co., 1927. Cloth, $1.50.

While this book deals more with generalities than with the actual duties of the dental assistant, so little has been written on the subject that the book supplies a want. Some procedures given are obsolete and do not describe a definite technic, such as the investing and casting of gold inlays. If the assistant is to do laboratory work, surely she should be instructed in ceramics.

Abt's Pediatrics. By 150 Specialists. Edited by Isaac A. Abt, M.D., Professor of Diseases of Children, Northwestern University Medical School, Chicago. Set complete in eight octave volumes totaling 8000 pages, with 1500 illustrations, and separate index volume free. Now ready, Volume VII containing 879 pages with 70 illustrations and Volume VIII containing 1102 pages with 388 illustrations and General Index to Volumes I to VIII. Philadelphia and London: W. B. Saunders Co. Cloth, $10.00 per volume. Sold by subscription.

As was said regarding the first several volumes of this set of books, it is the most extensive and complete system of pediatrics yet published. In its scope it covers the whole field of medicine and surgery of childhood. It is more inclusive than most systems of internal medicine, and the fund of information which it contains will be of value to the practitioner in any field of medicine.

Volume VII is psychiatric and neurological in intent. It deals with the physiology of the nervous system, surgery of the head and spine, brain and spinal cord, diseases of the nervous system, psychopathology of the child, defects of speech, and the sexual life of the

child. It is good compendium of existing knowledge of the subject.

Volume VIII contains a symposium upon diseases of the skin by seven authors. The eye and ear of childhood are discussed; hospitals for infants and children, medico-legal questions, tumors, encephalitis, and animal parasites. This last, in about one hundred and fifty pages, contains valuable statistical data of the incidence of these infections, and illustrations of their appearance. Infection with very rare, as well as the commoner, organisms is described.

These two new volumes complete the system which makes a milestone in pediatric literature.

Physicians of the Mayo Clinic and Mayo Foundation. A series of 635 biographical sketches, with 611 portraits and including complete and accurate data concerning the professional life of each physician prior to January 1, 1926. Octavo volume of 578 pages. Philadelphia and London: W. B. Saunders Co., 1927. Cloth, $7.00.

A few brief facts concerning each of the men who had been connected with the Mayo Clinic for a period of a year prior to 1926 is given, with a list of his scientific publications.

Books Received

Troubles We Don't Talk About. By J. F. Montague, M.D., F.A.C.S., of the University and Bellevue Hospital Medical College; Lecturer on Rectal Pathology. 248 pages, illustrated. Philadelphia: J. B. Lippincott Co., 1927. Cloth, $2.00.

Medical Insurance Examination: Modern Methods and Rating of Lives. By J. Paterson MacLaren, M.A. (Double Honours), B.Sc., M.B., C.M., and J. P. (Glasgow University and London Hospitals); Late Examiner for University of Cape of Good Hope and Chief Insurance Medical Officer. 312 pages. New York: William Wood & Co. Cloth, $5.75.

Mental Health of the Child. By Douglas Armour Thom, M.D. 46 pages. Cambridge, Mass.: Harvard University Press, 1928. Cloth, $1.00.

Mosquito Surveys. A Handbook for Anti-Malarial and Anti-Mosquito Field Workers. By Malcolm E. MacGregor, Entomologist, Wellcome Field Laboratory, Wisley, Surrey, England; Director, Colonial Office Anti-Malaria Survey of Mauritius (1922-1923). 293 pages, illustrated. New York: William Wood & Co., 1928. Cloth, $5.50.

The Art of Anesthesia. By Pauluel J. Flagg, M.D., Visiting Bronchoscopic Anaesthetist, Manhattan Eye and Ear; Anaesthetist to St. Vincent's Hospital, Fifth Avenue and Flower Hospitals, New York City. 384 pages, with 135 illustrations. Fourth Edition Revised. Philadelphia; J. B. Lippincott Co., 1928. Cloth, $5.00.

Diseases of the Throat, Nose, and Ear. By William Lamb, M.D., C.M. (Edin.), M.R.C.P. (Lond.), Consulting Surgeon, Birmingham Ear and Throat Hospital. Revised by Frederik W. Sydenham, M.D., C.M. (Edin.), F.R.C.S. (Edin.), D.P.H. (Vict.). Fifth Edition. 449 pages, illustrated. New York: William Wood & Co., 1927. Cloth, $4.50.

The Practical Medicine Series, 1927: The Eye, Ear, Nose and Throat. By Charles P. Small, M.D.; Albert H. Andrews, M.D.; George E. Shambaugh, M.D., and Elmer W. Gagens, M.D., all of Chicago, Illinois. Under the General Editorial Charge of Charles L. Mix, A.M., M.D. 526 pages. Chicago: The Year Book Publishers. Cloth, $2.50. Eight volumes, $15.00.

The Current Significance of the Word "Alum." By William D. Richardson, Former Editor, Industrial and Engineering Chemistry. 93 pages. Chicago: The Commonwealth Press, 1927. Cloth, $1.00.

The Infancy of Medicine. By Dan McKenzie, M.D. (Glasg.), F.R.C.S.E., F.S.A. 421 pages. New York: Macmillan Co., 1927.

Cancer Control. Report of an International Symposium held under the Auspices of the American Society for the Control of Cancer, Lake Mohonk, New York, September 20-24, 1926. Chicago: Surgical Publishing Co., 1927.

Robert Edward Lee. By R. Alexander Bate, A.B., M.D. 83 pages. Boston: The Stratford Co., 1927. Cloth, $1.50.

The Diseases of Infants and Children. By J. P. Crozer Griffith, M.D., Ph.D., Professor of Pediatrics in the Graduate School of Medicine of the University of Pennsylvania, and A. Graeme Mitchell, M.D., Professor of Pediatrics, College of Medicine, University of Cincinnati. Second edition, reset. Two octavo volumes totaling 1715 pages, with 461 illustrations, including 20 plates in colors. Philadelphia and London: W. B. Saunders Co., 1927. Cloth, $20.00 net.

Facts on the Heart. By Richard Cabot. Philadelphia: W. B. Saunders Co.

The Surgical Clinics of North America (issued serially one number every other month). Volume VI, Number VI (New Jersey Number, December 1926). 318 pages, 93 illustrations and complete index to Volume VI. Philadelphia and London: W. B. Saunders Co. Paper, $12.00; cloth, $16.00 net.

The Medical Clinics of North America. January 1927. 1082 pages, illustrated. Philadelphia and London: W. B. Saunders Co.

A Primer for Diabetic Patients. A Brief Outline of the Treatment of Diabetes with Diet and Insulin, Including Directions and Charts for the Use of Physicians in Planning Diet Prescriptions. By Russell M. Wilder, M.D., Section on Nutrition, Division of Medicine, Mayo Clinic. Third edition, reset. 12mo of 134 pages. Philadelphia and London: W. B. Saunders Co., 1927. Cloth, $1.50 net.

The Surgical Clinics of North America (issued serially, one number every other month). Volume 7, Number 1 (Cancer Number, February 1927.) 235 pages, with 153 illustrations. Philadelphia and London: W. B. Saunders Co. Per clinic year (February 1927 to December 1927). Paper, $12.00; cloth, $16.00 net.

1925 *Collected Papers of the Mayo Clinic and the Mayo Foundation,* Rochester, Minnesota. Octavo of 1078 pages, 252 illustrations. Philadelphia and London: W. B. Saunders Co. Cloth, $13.00 net.

General Index Volume of the Collected Papers of the Mayo Clinic and the Mayo Foundation, 1884 to 1925, inclusive. Octavo volume of 227 pages. Philadelphia and London: W. B. Saunders Co., 1926. Cloth, $5.00.

Sketch of the History of the Mayo Clinic and the Mayo Foundation. 185 pages. Philadelphia and London: W. B. Saunders Co. Cloth, $3.50.

Appendicitis. By Hubert Ashley Royster, A.B., M.D., Surgeon to Rex Hospital, Surgeon-in-Chief, St. Agnes Hospital, Raleigh, N. C.; Former President, Southern Surgical Association. Surgical Monographs under the editorial supervision of Dean Lewis, A.B., M.D., Professor of Surgery, Johns Hopkins University; Eugene H. Pool, A.B., M.D., Attending Surgeon, New York Hospital, and Arthur W. Elting, A.B., M.D., Professor of Surgery, Albany Medical College. 370 pages, illustrated. New York: D. Appleton & Co. 1927.

Diseases of the Skin. By Henry H. Hazen, A.M., M.D., Professor of Dermatology in the Medical Department of Georgetown University. Third edition. 572 pages, with 248 illustrations. St. Louis: C. V. Mosby Co., 1927. Cloth, $10.00.

Pyelography: Its History, Technique, Uses and Dangers. By Alex. E. Roche, M.A., M.D., M.Ch. (Camb.), F.R.C.S. (Eng.), Chief Assistant to a Surgical Unit, St. Bartholomew's Hospital, with an Introduction by Sir John Thomson-Walker, O.B.E., M.B., C.M., F.R.C.S., Senior Urologist and Lecturer on Urology, King's College Hospital. 118 pages, with 16 plates. New York: William Wood & Co., 1927. Cloth, $3.50.

A Handbook of Ophthalmology. By Humphrey Neame, F.R.C.S., Ophthalmic Surgeon, University College Hospital. 312 pages, with 12 plates, containing 41 colored illustrations and 194 text figures. New York: William Wood & Co., 1927. Cloth, $4.00.

The Principles of Sanitation. By C. H. Kibbey, Director of Sanitation, Tennessee Coal, Iron and Railroad Company, Birmingham, Ala. 354 pages, illustrated. Philadelphia: F. A. Davis Co., 1927. Cloth, $3.50.

Exposures of Long Bones and Other Surgical Methods. By Arnold K. Henry, M.B., B.Ch. (Univ. Dublin), F.R.C.S.I., Professor of Clinical Surgery, Royal School of Medicine, Cairo. 80 pages, illustrated. New York: William Wood & Co., 1927. Cloth, $3.50.

Handbook of Diseases of the Nose, Throat, and Ear. By W. S. Syme, M.D., F.R.F.P. & S.G., F.R.S.E., Lecturer on Diseases of the Throat and Nose, Glasgow University; Surgeon for Diseases of the Throat and Nose, Western Infirmary, Glasgow. 395 pages, illustrated. New York: William Wood & Co., 1927. Cloth, $5.00.

The Endocrines in General Practice. By W. Langdon Brown, M.A., M.D., F.R.C.P., Physician to St. Bartholomew's Hospital. 144 pages. New York: Paul B. Hoeber, 1927. Cloth, $3.00.

A Synopsis of Physiology. By A. Rendle Short, M.D., B.S., B.Sc., F.R.C.S., Surgeon to the Bristol Royal Infirmary; Lecturer in Physiology to the University of Bristol. 258 pages, illustrated. New York: William Wood & Co., 1927. Cloth, $3.50.

Aids to Gynaecology. By Richard E. Tottenham, B.A., M.D., D.P.H. (Univ. of Dublin), F.R.C.P.I., Professor of Obstetrics and Gynaecology, University of Hong Kong; Obstetrician and Gynaecologist to the Government Civil Hospital. Seventh Edition. 131 pages. New York: William Wood & Co., 1927. Cloth, $1.25.

Methods and Problems of Medical Education (Eighth Series). New York: The Rockefeller Foundation, 1927.

Diseases of the Nose, Throat and Ear. Edited by A. Logan Turner, M.D., LL.D., F.R.C.S.E., Consulting Surgeon, Ear and Throat Department, Royal Infirmary, Edinburgh; formerly Lecturer on Diseases of the Ear, Nose and Throat, University of Edinburgh, with the collaboration of several others. Second edition, revised and enlarged. 440 pages, with 234 illustrations and 12 plates. New York: William Wood & Co., 1927. Cloth, $6.00.

Aids to Biochemistry. By E. Ashley Cooper, D.Sc. (Lond.), F.I.C., A.R.C.S. (Lond.), and S. D. Nicholas, B.A. (Oxon.), A.I.C., Lecturers in Chemistry, University of Birmingham. 188 pages. New York: William Wood & Co., 1927. Cloth, $1.50.

A Manual of Materia Medica and Pharmacology. By David M. R. Culbreth, Ph.G., M.D., Professor Emeritus of Botany, Materia Medica and Pharmacology, Maryland College of Pharmacy, Department of the University of Maryland, Baltimore, Md. Seventh edition, thoroughly revised. 1046 pages, 497 illustrations. Philadelphia: Lea & Febiger. Cloth, $8.00.

Actinotherapy. By H. G. Falkner, L.R.C.S.I., L.R.C.P.I., L.M., Rot. Dub., O.B.E., Acting Therapeutist to the London Teachers' Association. 152 pages. New York: William Wood & Co., 1927. Cloth, $3.00.

An Introduction to Forensic Psychiatry in the Criminal Courts. By W. Norwood East, M.D. (Lond.), Medical Inspector, H. M. Prisons, England and Wales. 381 pages. New York: William Wood & Co., 1927. Cloth, $5.00.

Special Dental Pathology. By Julio Endelman, M.S., D.D.S., F.A.C.D., Professor of Special Dental Pathology and Therapeutics, College of Dentistry, University of Southern California; Editor of the Pacific Dental Gazette. Second edition. 444 pages, with 371 illustrations. St. Louis: C. V. Mosby Co., 1927. Cloth, $7.00.

Tonic Hardening of the Colon. By T. Stacey Wilson, M.D. and B.Sc. (Edin.), F.R.C.P. (Lond.). 210 pages. New York: Oxford University Press, 1927.

Food and the Principles of Dietetics. By Robert Hutchison, M.D. (Edin.), F.R.C.P., Physician, London Hospital and Hospital for Sick Children, Great Ormond Street. Sixth edition. 609 pages, with plates and diagrams. New York: William Wood & Co., 1927. Cloth, $5.00.

The Normal Diet. By W. D. Sansum, M.S., M.D., F.A.C.P., Director, Potter Metabolic Clinic, Department of Metabolism, Santa Barbara Cottage Hospital, Santa Barbara, Cal. Second edition. 136 pages. St. Louis: C. V. Mosby Co., 1927. Cloth, $1.50.

Tobacco and Physical Efficiency. By Pierre Schrumpf-Pierron, M.D., Professor of Clinical Medicine, University of Cairo. 134 pages. New York: Paul B. Hoeber, 1927. Cloth, $1.85.

Diseases of the Mouth. By Sterling V. Mead, D.D.S., Professor of Oral Surgery and Diseases of the Mouth, Georgetown Dental School; Professor of Diseases of the Mouth, Georgetown Medical School. 578 pages, with 274 illustrations. St. Louis: C. V. Mosby Co., 1927. Cloth, $10.00.

Demonstrations of Physical Signs in Clinical Surgery. By Hamilton Bailey, F.R.C.S. (Eng.), Surgeon, Dudley Road Hospital, Birmingham, Eng. 217 pages, with 261 illustrations. New York: William Wood & Co., 1927. Cloth, $6.50.

Handbook of Diseases of the Ear. By Richard Lake, F.R.C.S. (Eng.), Consulting Surgeon, Royal Ear Hospital (University College Hospital); Duvern Lecturer in Otology, University of London, and E. A. Peters, M.D. (Cantab.), F.R.C.S. (Eng.), Surgeon, Royal Ear Hospital. 310 pages, illustrated. Fifth edition. New York: William Wood & Co., 1927. Cloth, $4.00.

An Introduction to Clinical Perimetry. By H. M. Traquair, M.D., F.R.C.S. Ed., Assistant Ophthalmic Surgeon, Royal Infirmary, Edinburgh; Lecturer on Diseases of the Eye, Edinburgh University. 264 pages, with 164 illustrations. St. Louis: C. V. Mosby Co., 1927. Cloth, $13.50.

The Queen Charlotte's Practice of Obstetrics. By J. Bright Banister, M.D., F.R.C.S., Obstetric Physician, Charing Cross Hospital; Aleck W. Bourne, M.B., F.R.C.S.; Trevor B. Davies, M.D., F.R.C.S.; L. Carnac Rivett, M.C., F.R.C.S.; L. G. Phillips, M.S., F.R.C.S., and C. S. Lane-Roberts, M.S., F.R.C.S. 629 pages, with 270 text figures and 4 colored plates. New York: William Wood & Co., 1927. Cloth, $7.00.

Opium. By John Palmer Gavit, formerly Managing Editor, New York Evening Post; Chief of the Washington Bureau, Associated Press. 308 pages. New York: Brentano's Publishing Department, 1927. Cloth, $3.50.

The Rockefeller Foundation Annual Report, 1926. 466 pages. New York: The Rockefeller Foundation, 1927.

International Clinics. Volume III, Thirty-Seventh Series, 1927. By leading members of the Medical Profession throughout the world. 311 pages, illustrated. Philadelphia and London: J. B. Lippincott Co., 1927.

Modern Medicine, Its Theory and Practice. Edited by Sir William Osler, Bart., M.D., F.R.S., Late Regius Professor of Medicine in Oxford University, England; Honorary Professor of Medicine in the Johns Hopkins University, Baltimore. Third edition, thoroughly revised by T. McCrae, Professor of Medicine, Jefferson Medical College, Philadelphia. Volume V. 948 pages, illustrated. Philadelphia: Lea & Febiger, 1927. Cloth, $9.00.

Minor Surgery. By Arthur E. Hertzler, M.D., F.A.C.S., Chief Surgeon, Halstead Hospital, and Victor E. Chesky, A.B., M.B., M.D., F.A.C.S., Chief Resident Surgeon, Halstead Hospital. 568 pages, 438 illustrations. St. Louis: C. V. Mosby Co., 1927. Cloth, $10.00.

A Synopsis of Surgery. By Ernest W. Hey Groves, M.S., M.D., B.Sc. (Lond.), F.R.C.S. (Eng.), Surgeon, Bristol General Hospital; Professor of Surgery, Bristol University; Examiner in Surgery, Universities of London, Liverpool, Leeds and Sheffield. Eighth edition. 674 pages, illustrated. New York: William Wood & Co. Cloth, $5.00.

Treatment of Venereal Disease in General Practice. By E. T. Burke, D.S.O., M.B., Ch.B. (Glas.), Venereal Diseases Officer to the County Borough of Warrington; Member of Council, Medical Society for the Study of Venereal Disease. 158 pages. New York: Oxford University Press. Cloth, $1.75.

Surgery, Its Principles and Practice. By Astley Paston Cooper Ashhurst, A.B., M.D., F.A.C.S., Professor of Clinical Surgery, University of Pennsylvania. Third edition, revised. 1179 pages, with 1046 illustrations and 15 colored plates. Philadelphia: Lea & Febiger, 1927. Cloth, $10.00.

Practice of Urology and Syphilology. A Surgical Treatise on Genito-Urinary Diseases and Syphilis. By Charles H. Chetwood, M.D., LL.D., F.A.C.S., Attending Urologist and Director of Service, French Hospital; Consulting Surgeon, Bellevue Hospital. Fourth edition. 879 pages, illustrated. New York: William Wood & Co. Cloth, $9.00.

Blood Pressure, Its Clinical Applications. By George William Norris, A.B., M.D., Professor of Clinical Medicine, University of Pennsylvania. Henry Cuthbert Bazett, M.B., B.Ch. (Oxon.), F.R.C.S. (Eng.), Professor of Physiology in the University of Pennsylvania, and Thomas M. McMillan, A.B., M.D., Assistant Physician to the Pennsylvania Hospital. Fourth edition, thoroughly revised. 387 pages, with 47 engravings and 1 colored plate. Philadelphia: Lea & Febiger, 1927. Cloth, $4.50.

Epidemic Encephalitis (Encephalo-Myelitis). By Leo M. Crafts, B.L., M.D. (Harv.), formerly Dean and Professor of Nervous and Mental Diseases, Medical Department of Hamline University, Minneapolis, Minn. 237 pages. Boston: Richard G. Badger, 1927.

The Ear, Nose and Throat in General Practice. By D. A. Crow, M.B., Ch.B. (Edin.), Otolaryngologist, the Royal Sussex County Hospital, Brighton; the Sussex Throat and Ear Hospital. 148 pages, illustrated. New York: Oxford University Press. Cloth, $3.25.

The Essentials of Otology. By George Birmingham McAuliffe, A.B., M.D., F.A.C.S., Assistant Professor of Otology, Cornell Medical College. 170 pages. New York: Oxford University Press. Cloth, $4.00.

Ophthalmic Year Book. Volume XXIII. 338 pages. Chicago: Ophthalmic Publishing Co., 1927.

Everywoman a Nurse. By Edith Newsome, S.R.N., Member of Royal British Nurses' Association; Certificated. 204 pages, illustrated. New York: Oxford University Press. Cloth, $1.25.

The Ship Sails On. By Nordahl Grieg. Translated from the Norwegian by A. G. Chater. 219 pages. New York: Alfred A. Knopf.

Clinical Laboratory Procedures. By George L. Rohdenburg, M.D., Director of Laboratories, Lenox Hill Hospital; Beth David Hospital, New York. 266 pages. New York: Macmillan Co., 1927. Cloth, $3.25.

The Science and Practice of Surgery. Volumes I and II. By W. H. C. Romanis, M.A., M.B., M.Ch., Cantab, F.R.C.S. (Eng.), F.R.S. (Edin.), Senior Surgeon-in-Charge, Out-Patients and Teacher of Practical Surgery, St. Thomas' Hospital; Examiner in Surgery, University of Cambridge, and Philip H. Mitchiner, M.D., M.S. (Lond.), F.R.C.S. (Eng.), Surgeon-in-Charge of Out-Patients, Teacher of Operative Surgery and Demonstrator of Anatomy, St. Thomas' Hospital. New York: William Wood & Co., 1927.

The Medical Department of the United States Army in the World War. Volume II. Prepared under the Direction of Maj. Gen. M. W. Ireland, The Surgeon General. Washington: United States Government Printing Office, 1927.

Annual Report of the Surgeon General of the Public Health Service of the United States for the Fiscal Year 1927. Washington: United States Government Printing Office, 1927.

Southern Medical News

ALABAMA

The alumni of the School of Medicine, University of Alabama, and graduates of the Birmingham Medical College, also alumni of the School of Medicine of the University, who were attending the annual meeting of the Southern Medical Association in Memphis, Tennessee, November 14-17, 1927, held a dinner meeting at the Peabody Hotel, Memphis, on the evening of November 15. An organization was effected and the following officers elected for the ensuing year: Dr. Gilbert F. Douglas, Birmingham, President, Dr. R. C. McQuiddy, Birmingham, Vice-President, and Dr. J. H. Somerville, Tuscaloosa, Secretary. At this meeting many things of vital interest to all the alumni were discussed. It was the unanimous opinion of those present that there should be an alumni meeting during the Alabama State Medical Association in Birmingham, April 1928, and that there should be a larger attendance of the alumni at the Southern Medical Association meeting in Asheville, North Carolina, November 1928.

The Women's Auxiliary of the Jefferson County Medical Society met in Birmingham, January 24, for election of officers and discussion of plans for the entertainment of the wives and daughters of the physicians who will attend the State Medical Convention in Birmingham, April 17-20. A very attractive program for the women guests was planned. The Auxiliary voted to cooperate in every possible way with the Jefferson County Medical Society to make pleasant the stay of the visitors. The officers elected were: President, Mrs. Cecil Gaston; First Vice-President, Mrs. O. P. Board; Second Vice-President, Mrs. G. E. Murphy; Secretary, Mrs. W. S. Armour; Treasurer, Mrs. D. C. Donald.

Mrs. Howard Beavers has assumed the Superintendency of the Citizen's Hospital, Talladega, succeeding Eola Farris, resigned.

Deaths

Dr. Thomas Marion Peters, Fayette, aged 68, died October 15 of carcinoma of the stomach.

Dr. Chester Arthur Glover, Bessemer, aged 44, died November 21.

ARKANSAS

Dr. C. W. Garrison, State Health Officer of Arkansas for the past thirteen years, has been reelected for another four year term.

Craighead County Medical Society has elected Dr. H. A. Stroud, Jonesboro, President; Dr. J. W. Elder, Harrisburg, and Dr. L. H. McDaniel, Tyronza, Vice-Presidents; Dr. P. W. Lutterloh, Jonesboro, Secretary; Dr. H. H. McAdams, Jonesboro, Treasurer.

Greene County Medical Society has elected Dr. F. M.

(Continued on page 34)

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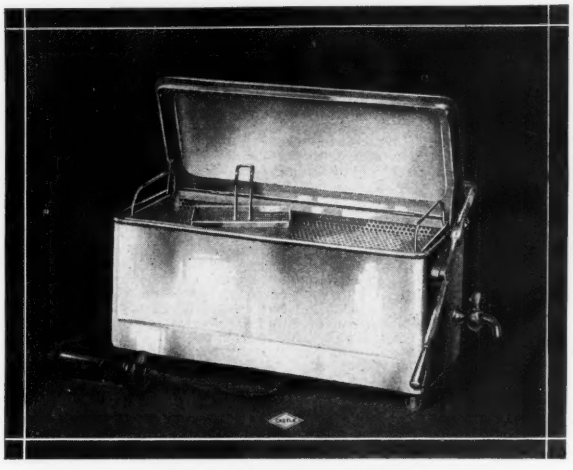

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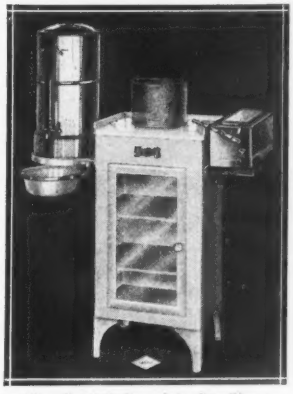

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Name.....

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(Continued from page 168)

Scott, Paragould, President; Dr. J. J. Hudgins, Marmaduke, and Dr. G. T. Hopkins, Paragould, Vice-Presidents; Dr. W. M. Majors, Paragould, Secretary-Treasurer.

Saline County Medical Society has elected Dr. Dewell Gann, Sr., Benton, President; Dr. J. D. Wright, Mabelvale, Vice-President; Dr. T. E. Buffington, Benton, Secretary-Treasurer.

Union County Medical Society has elected Dr. J. M. Sheppard, El Dorado, President; Dr. M. V. Russell, El Dorado, Vice-President; Dr. G. D. Murphy, El Dorado, Secretary.

The Cotton Belt Surgeons Association held its annual meeting in Texarkana December 7.

Dr. I. N. McCollum, Conway, has been appointed Local Surgeon for the Missouri Pacific Railroad.

Mr. H. G. Harcrow, Dallas, Texas, was recently appointed Superintendent of the Baptist State Hospital, Little Rock.

Deaths

Dr. T. A. Fowler, Blue Springs, aged 68, died October 21 of nephritis.

Dr. D. J. Leake, Keo, aged 80, died October 18 in England of nephritis.

Dr. Allen Frederick Emerson, Medical Officer at the United States Veterans Hospital, Fort Logan H. Roots, aged 59, died November 23 of myocarditis with acute dilatation of the heart.

Dr. Carl Finch, McCrory, aged 48, died November 9.

Dr. Benjamin McCrary Witt, Little Rock, aged 49, died December 5.

Dr. Lorenzo D. Horn, Egypt, aged 74, died in a hospital in Jonesboro November 18 of pneumonia.

DISTRICT OF COLUMBIA

The Medical Society of the District of Columbia held a public memorial meeting at its auditorium November 26 for the late Dr. John Wesley Bovee. Tributes were paid to the life and work of Dr. Bovee by prominent physicians.

Dr. Charles John Demas, Washington, and Miss Helen Galanis, Athens, Greece, were married September 29.

Deaths

Dr. Edward Stillman May, Washington, aged 82, died September 1 of senile debility.

FLORIDA

The Seaboard Air Line Railway Surgeons Association recently met in Miami. Dr. B. J. Witherspoon, Charlotte, North Carolina, was elected President; Dr. W. C. Powell, Petersburg, Virginia, Vice-President. Dr. Joseph M. Burke, Norfolk, Virginia, is Chief Surgeon of the road.

Duval County Medical Society has elected Dr. S. E. Driskell, President; Dr. Edward Jelks, Vice-President; Dr. Kenneth Morris, Secretary; Dr. W. M. Shaw, Treasurer; and Dr. John E. Boyd as a member of the Board of Governors for a three year period.

Pensacola has established a hospital for contagious diseases. The hospital has been obtained through the efforts of the Escambia County Medical Society, a building having been given by a citizen of Pensacola. The Society is now asking the County to appropriate the sum of $10,000 for maintenance.

The Alachua Hospital, Gainesville, has recently been completed and opened. It has a capacity of twenty-four patients. Mrs. Margaret A. Mays is Superintendent.

Dr. Samuel E. Field, Lemon City, has removed to Centerville, Mississippi, where he will be associated with his brother, Dr. Richard J. Field, in the operation of a thirty-bed hospital known as the Field Clinic.

Dr. Bert W. Caldwell, Superintendent of the new municipal hospital, Tampa, and the Gordon Keller Hospital, has resigned.

Deaths

Dr. William Jessup Chandler, Miami, aged 85, died October 30 at the Victoria Hospital of chronic myocarditis.

Dr. John Beaumont Bauguss, Lake City, aged 46, died November 1 at the Lake Shore Hospital of Myocarditis and mitral stenosis.

Dr. Jimie Lee Pennington, Lake Wales, aged 53, was killed November 4 in an automobile accident.

(Continued on page 36)

An Obligation

The medical profession, deservedly, occupies a high place in the public esteem. As is well and generally understood, this implies great responsibilities. The layman, in these days of scientific achievement, expects the physician to use the most modern methods available. And the profession must keep faith with the public—constantly.

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(Continued from page 34)

Dr. Oscar Burnham Beer, Coral Gables, aged 57, died October 13 of heart disease.

Dr. James Walter Stephens, DeLand, aged 64, died October 10 of hypertrophic cirrhosis of the liver.

GEORGIA

First District Medical Society has elected Dr. L. F. Lanier, Rocky Ford, President; Dr. Wm. H. Myers, Savannah, and Dr. G. W. Elarbee, Daisy, Vice-Presidents; Dr. W. V. Long, Savannah, Secretary-Treasurer.

Second District Medical Society has elected Dr. J. A. Redfearn, Albany, President; Dr. Chas. H. Watt, Thomasville, Secretary-Treasurer.

Third District Medical Society has elected Dr. J. T. Stukes, Americus, President; Dr. V. C. Daves, Vienna, Vice-President; Dr. Chas. A. Greer, Oglethorpe, Secretary-Treasurer.

Fifth District Medical Society has elected Dr. W. S. Ansley, Decatur, President; Dr. W. E. Barber, Atlanta, Vice-President; Dr. R. T. Camp, Fairburn, Secretary-Treasurer.

Sixth District Medical Society has elected Dr. W. C. Miles, Griffin, President; Dr. G. T. Miller, Macon, Vice-President; Dr. O. R. Thompson, Macon, Secretary-Treasurer.

Seventh District Medical Society has elected Dr. W. E. Wofford, Cartersville, President; Dr. R. M. Harbin, Rome, Vice-President; Dr. M. M. McCord, Rome, Secretary-Treasurer.

Ninth District Medical Society has elected Dr. B. B. Davis, Gainesville, President; Dr. L. G. Neal, Cleveland, Vice-President; Dr. J. C. Bennett, Jefferson, Secretary-Treasurer.

Tenth District Medical Society has elected Dr. W. J. Cranston, Augusta, President; Dr. S. T. R. Revell, Louisville, Vice-President; Dr. C. D. Ward, Augusta, Secretary-Treasurer.

Eleventh District Medical Society has elected Dr. J. R. McMichael, Quitman, President; Dr. Albert Fleming, Folkston, Vice-President; Dr. W. F. Reavis, Waycross, Secretary-Treasurer.

Plans are nearing completion for the new hospital to be used exclusively for children under twelve years of age to be erected in Atlanta. The institution is the gift of the late Thomas Egleston and the first unit will be known as the Henrietta Egleston Memorial Hospital in honor of his mother. The cost will be approximately $175,000. The new building will have fifty beds, forty-two of which will be for charity patients.

Following a test conducted by the U. S. Bureau of the Census, it was found that Georgia was registering more than 90 per cent of its births and deaths and will be admitted to the birth and death registration areas in 1928.

A barbecue was given November 5 at Boulder Crest, Atlanta, the home of Dr. E. C. Thrash, honoring the Fulton County Medical Society.

Dr. E. C. Seawright, Fayetteville, has been elected Mayor of that city.

Dr. R. M. Harbin, Rome, has been elected a member of the Board of Directors of the American College of Surgeons.

The following have been elected to fellowship in the American College of Surgeons: Dr. Kenneth McCullough, Waycross; Dr. W. A. Norton and Dr. Geo. H. Lang, Savannah; Dr. A. R. Rozar and Dr. C. H. Richardson, Macon.

Dr. T. M. Hall, Milledgeville, has been elected Vice-President of the Board of Trustees of the State Sanitarium, Milledgeville.

Capt. Melton D. Council, Med.-Res., McRae, has been relieved from 382d Service Battalion and assigned to 420th Engineer Battalion.

Capt. Murdock S. Equen, Med.-Res., Atlanta, has been relieved from General Hospital No. 43 and assigned to 344th Med. Regt. Hosp. Co. No. 431.

Capt. Joseph R. Barfield, Med.-Res., Atlanta, is relieved from General Hospital No. 43 and assigned to Ambulance Co. No. 432.

Major Herbert B. Kennedy, Med.-Res., Atlanta, has been relieved from Gen. Hosp. No. 90 and assigned to 67th Coast Artillery as Surgeon.

Dr. W. R. Smith has been appointed Lieutenant in the U. S. N. Reserve Corps.

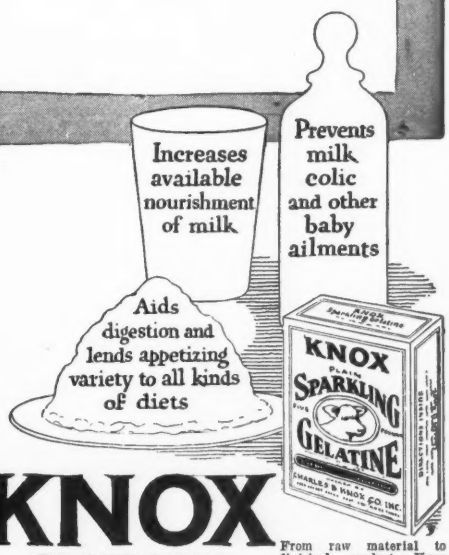
Dr. L. B. Robinson, Atlanta, has been made a Fellow of the American College of Physicians.

Deaths

Dr. W. C. Pirkle, Baxley, aged 54, died October 30.

(Continued on page 38)

"*Diet* in the treatment of *Diabetes*" . . . let us send you this booklet - and valuable recipes


Increases available nourishment of milk
Prevents milk colic and other baby ailments
Aids digestion and lends appetizing variety to all kinds of diets
KNOX
PLAIN
SPARKLING
GELATINE
CHARLES B. KNOX CO. INC.

WAYS of improving the diabetic diet are always important. There are two ways to improve it—make it more appetizing—make it more effective. Monotony in the diabetic diet is its chief enemy!

Here's where Knox Sparkling Gelatine plays an important part. Made plain and pure—having no flavoring, coloring or sugar content—it is an ideal food for the purpose. It combines so deliciously with the fruits, vegetables, chicken and other foods you prescribe for diabetes—it makes them taste *different—it* prevents monotony from defeating the patient's appetite. And furthermore, Knox Gelatine, with its colloidal ability, makes the foods with which it is combined easier to digest—it adds health to the diabetic menu.

Knox Gelatine is a pure protein yielding four calories per gram.

We have literature and recipes, prepared by eminent dieticians, especially for the diabetic diet. May we send these to you? They are being used by many physicians with gratifying success.

KNOX GELATINE LABORATORIES
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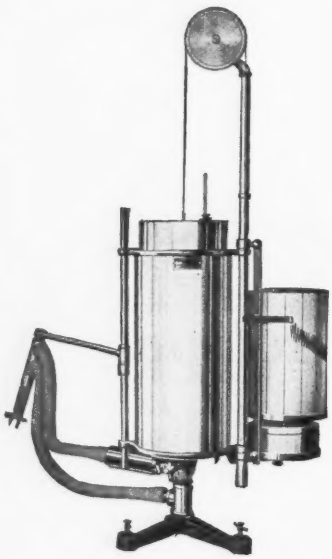
SPARKLING
GELATINE
"The Highest Quality for Health"

From raw material to finished product Knox Sparkling Gelatine is constantly under chemical and bacteriological control, and is never touched by hand while in process of manufacture.

The
BENEDICT-ROTH
RECORDING
METABOLISM APPARATUS



EXCELS IN
WORKMANSHIP
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SIMPLICITY

MORE THAN 1000 IN USE
WITH NEARLY 100 IN BOSTON ALONE

It must be good because
made exclusively by

Warren E. Collins

Specialist in Metabolism Apparatus

555 Huntington Ave., Boston, Mass.

Formerly with the Carnegie Nutrition Laboratory 1908-20

(Continued from page 36)

Dr. John Thomas Latimer, Loneoak, aged 89, died October 13 of injuries received in a fall.

Dr. Henry T. Simpson, Smithville, aged 47, died November 20 of angina pectoris.

Dr. Charles G. Meeks, Bowman, aged 37, died suddenly November 11.

Dr. James A. Wise, Hapeville, aged 80, died October 18 at the Wesley Memorial Hospital, Atlanta, of prostatectomy.

KENTUCKY

Deaths

Dr. William Bryan, Parnell, aged 84, died May 26.

Dr. Atwood P. Latham, Elizabethtown, aged 58, died October 26 of heart disease.

Dr. Jonathan Robert Guthrie, Louisville, aged 78, died November 19 of chronic interstitial nephritis.

Dr. James T. Scott, Williamstown, aged 82, died November 13 of softening of the brain.

Dr. Robert Andrew Irvin, Clay City, aged 55, died November 5 at St. Joseph's Hospital, Lexington, of uremia and chronic nephritis.

Dr. Joseph H. Aud, Whitesville, aged 51, died October 19.

Dr. Bascom C. Rose, Bryantsville, aged 45, died December 4 of skull fracture received when struck by an automobile.

Dr. James Alfred Fisher, Hickman, aged 38, died October 26.

LOUISIANA

The annual Clinical Session of the American College of Physicians will be held in New Orleans, March 5-9.

Bi-Parish Medical Society has elected Dr. E. M. Toler, Clinton, President; Dr. J. W. Lea, Jackson, Vice-President; Dr. C. S. Miller, Jackson, Secretary-Treasurer.

St. Tammany Parish Medical Society has elected Dr. F. F. Young, President; Dr. W. E. Stevenson, Vice-President; Dr. L. R. Young, Secretary-Treasurer.

At the annual meeting of the Society of the Medical and Surgical Staff of Charity Hospital, New Orleans, the following officers were elected: Dr. Jerome E. Landry, President; Dr. Lucien H. Landry, Vice-President; Dr. Lucien A. LeDoux, Secretary-Treasurer. Dr. A. E. Fossier, Dr. S. Chaille Jamison, Dr. H. W. Kostmayer and Dr. B. A. Ledbetter, members of the Medical Advisory Committee.

Dr. Ogilvie M. Larimore and Dr. Roy F. Feemster have been appointed instructors in Pathology at Tulane University School of Medicine, New Orleans; Dr. Reginald A. Cutting and Dr. Maxwell M. Wintrobe have been appointed instructors in Surgery and Medicine, respectively.

Dr. T. R. Heath, formerly Superintendent of the Flint-Goodridge Hospital, New Orleans, is now Superintendent of Bethany Hospital, Kansas City, Kans. He has been succeeded by Dr. H. W. Knight.

Dr. Harold Guegnon Fabien Edwards and Miss Marguerite L. Sanaren, both of Lafayette, were married November 26.

Deaths

Dr. Richard Leander Seagle, Jesuit Bend, aged 51, died November 15 at New Orleans.

MARYLAND

The Baltimore City Fire Department has established a modern infirmary for the treatment of its own men by fire department physicians. Up to this time the sick and injured firemen were treated at the offices of physicians; now they are sent to the infirmary in ambulances. The number treated since the infirmary opened is said to average twenty a day. Dr. Frank N. Ogden, Dr. James E. Peterman and Dr. Oliver S. Lloyd are in charge of the infirmary.

Work on the building of the new William H. Welch Medical Library of Johns Hopkins University School of Medicine will begin at once. The general Education Board, New York, made the library possible by a gift of $750,000, and has agreed to give an additional $250,000 for maintenance of the library and of the chair of history of medicine on condition that the University raise $500,000 for maintenance. Dr. William H. Welch, Director of the Library, is now in Europe studying medical libraries.

(Continued on page 40)

HOW MANY TIMES A DAY DO YOU WASH YOUR HANDS?

PATCH'S NEPTO LOTION

will keep them soft and smooth

Surgeons, Physicians and Nurses are obliged to wash their hands very frequently. Mothers, too, who have children to care for or housework to do, must have their hands frequently in water.

You know how hard it is to keep them from chapping during the cold weather. Here at last is the lotion that gives the desired protection.

NEPTO LOTION is different from other lotions. It is made with a base of Irish Moss, combined with glycerin and alcohol in just the right proportions to keep the skin soft and smooth. It relieves chapping and protects the soft texture of the skin.

Just a few drops of NEPTO LOTION, applied right after drying the hands, will work wonders! You'll be surprised how soft and pliable your skin will keep.

A bottle of NEPTO LOTION kept on hand, on the wash stand or in the office, will save you that uncomfortable feeling which rough, chapped hands always cause. It is fine after shaving.

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Makers of Patch's Cod Liver Oil

THE E. L. PATCH CO., Stoneham 80, Boston, Mass.

Send me a trial bottle of Nepto Lotion.

Name .....

Street and Number.....

City and State.....

Druggist's Name.....S.M.F.

(Continued from page 38)

A Rural Health Center has been established at Kitzmiller in Garrett County. The building was built by the community, some industrial concerns providing lumber and paint. Three carpenters rearranged the interior of the building, providing shelves for linens and other supplies kept by the public health nurse, and partitioning off two rooms for community needs, health conferences, immunization clinics, health clubs and classes, and other related activities. Three painters in the neighborhood painted the building, and two electricians installed electric lights. A teacher and some girls from the high school tinted the inside walls and a business firm in an adjoining town donated the furniture.

A testimonial dinner was given at Baltimore December 1 in recognition of the reappointment of Dr. Charles Hampson Jones as Commissioner of Health of Baltimore. As a further token of appreciation of his work, Dr. Jones was presented with $500 in gold. Dr. Jones has been associated with the Department of Health of Baltimore for thirty-one years.

The course of lectures of the Herter Foundation were given at the School of Hygiene and Public Health, Johns Hopkins University, Baltimore, November 3-5, by Dr. Sven Ingvar, University of Lund, Sweden.

Deaths

Dr. Harry Boyd, Baltimore, aged 61, died November 30 following a long illness.

Dr. Scott Kennedy Wilson, Baltimore, aged 68, died November 21 following an operation.

Dr. William Brinton Perry, Baltimore, aged 61, died at the Maryland General Hospital, November 25 following an operation for carcinoma.

MISSISSIPPI

The annual meeting of the Issaquena-Sharkey-Warren County Medical Society was held in Vicksburg December 13. The following officers were elected: Dr. W. H. Scudder, Mayersville, President; Dr. J. B. Benton, Valley Park, Issaquena County, Dr. W. C. Pool, Cary, Sharkey County, and Dr. L. J. Clark, Vicksburg, Warren County, Vice-Presidents; Dr. L. S. Lippincott, Vicksburg, Secretary-Treasurer. For long and distinguished service to organized medicine in this state, Dr. Hugh H. Haralson, Vicksburg, was elected to life membership.

Jackson County Medical Society has elected Dr. J. N. Rape, Moss Point, President; Dr. S. B. McIlwain, Pascagoula, Vice-President; Dr. J. N. Lockard, Pascagoula, Secretary.

South Mississippi Medical Society met in Hattiesburg December 8. Dr. H. L. McKinnon, Hattiesburg, was elected President; Dr. R. H. Foster, Laurel, and Dr. H. P. Smith, New Augusta, Vice-Presidents; Dr. P. E. Smith, Hattiesburg, Secretary-Treasurer.

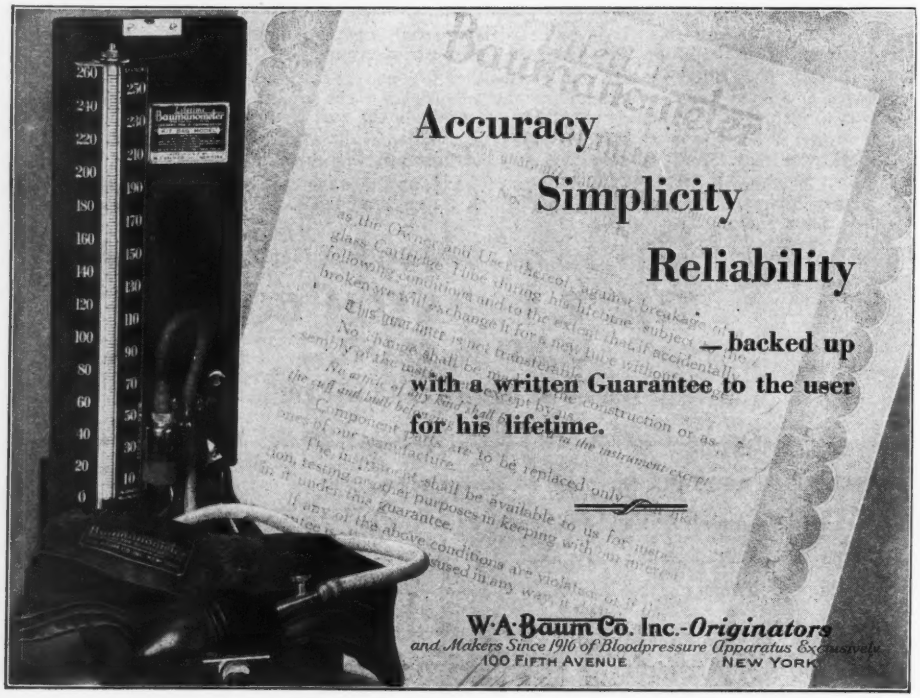
Through the co-operation of the U. S. Public Health Service and the Rockefeller Foundation in pooling funds with State and County funds, a well organized full-time health department has been brought about in each of the formerly flooded counties in the State. The routine activities of the full-time health department include general sanitation, rural and urban; inspection of dairies and food establishments; physical inspection of school children; the control of communicable diseases; organizing and conducting of infant welfare, pre-school and pre-natal clinics; supervision and training of midwives; and the conducting of general educational campaigns pertaining to prevention of disease and the promotion of public health.

The Poplarville Hospital was burned December 9. The patients were removed to the Pearl River Hospital.

Dr. J. C. Rush, Waynesboro, has been appointed Health Officer of Wayne County succeeding Dr. O. A. Lomax, deceased.

Dr. Samuel E. Field, Lemon City, Florida, has removed to Centerville, where he will be associated with

(Continued on page 42)



Important Announcement

IT is with pleasure that the Abbott Laboratories announce the purchase of the business, good will, equipment and products of John T. Milliken and Co., of St. Louis, manufacturers since 1894 of reliable pharmaceutical preparations.

It will be the policy of the Abbott Laboratories to continue the manufacture of the Milliken line and to maintain the present high standard of purity.

The research staff and facilities of both the Abbott and Milliken firms will continue to be devoted to the development of "The Best Pharmaceutical Products of Today and the Better Products of Tomorrow."

This notable addition to the service of the Abbott Laboratories became effective January 3rd, 1928.

Orders for Milliken preparations will continue to be filled promptly from the St. Louis address, or orders may be sent to the home office of the Abbott Laboratories at North Chicago. Our branches as well as the wholesale and retail drug trade will be stocked with the Milliken Specialties as soon as possible.

EXECUTIVE OFFICES

ALFRED S. BURDICK
PRESIDENT

ABBOTT LABORATORIES
NORTH CHICAGO, ILLINOIS

(Continued from page 40)

his brother, Dr. Richard J. Field. They will operate a thirty-bed hospital known as the Field Clinic.

Deaths

Dr. William Orville Harris, Rome, aged 82, died November 21 of chronic interstitial nephritis.

Dr. Robert L. Turner, Meridian, aged 62, died November 9.

Dr. Jesse Howard Milton, Baldwyn, aged 45, died suddenly November 24 of heart disease.

MISSOURI

Crawford County Medical Society has elected Dr. R. C. Parker, President; Dr. W. J. Parker reelected Secretary.

Franklin County Medical Society has elected Dr. J. L. Walker, Union, President; Dr. W. H. Wagner, Washington, Vice-President; Dr. H. A. May, Washington, Secretary-Treasurer.

Lafayette County Medical Society has elected Dr. R. C. Schooley, President; Dr. Odus Liston and Dr. W. E. Martin, Vice-Presidents; Dr. W. E. Koppenbrink, Secretary-Treasurer.

St. Louis Medical Society has elected Dr. Charles H. Neilson, President; Dr. Drew W. Autell and Dr. Jonas Curtis Lyter, Vice-Presidents; Dr. Roland S. Kieffer, Secretary, reelected.

A gift of $300,000 has been made to the Jewish Hospital, St. Louis, as a memorial to the late Moses Shoenberg, a Jewish philanthropist, St. Louis, who died in 1925, being made by his widow and his son, Sidney M. Schoenberg. Practically the entire sum will be used in the construction of a nurses' home for the hospital.

The Shriners' Hospital for Crippled Children, St. Louis, is to be enlarged, $120,000 having been set aside for this purpose. The addition will house hospital attendants and physicians, and will include a classroom for the children undergoing treatment in the hospital. It will be a two-story structure. The northern wing of the hospital was damaged by the recent tornado and is being repaired at a cost of about $52,000.

The new building of the St. Louis Medical Society was officially dedicated to medical science November 1. This is the second real home of the Society, the first having been built in 1906, partly through the efforts of Dr. Alonzo R. Kieffer, Treasurer of the St. Louis Medical Society for eight years. The building was erected and equipped at a cost of approximately $300,000. The auditorium will seat about 1,000 persons. The library comprises something like 25,000 volumes.

The new home for nurses at the Washington University School of Nursing, St. Louis, was dedicated November 26. The building was completed at a cost of $500,000.

The Abbott Laboratories, North Chicago, Illinois, announces the purchase of John T. Milliken & Company, St. Louis. Dr. Alfred S. Burdick, President of the Abbott Laboratories, states that the Milliken business will be continued at St. Louis for the present with no changes in the personnel. It will be operated as a branch of the Abbott Laboratories.

James B. Macelwane, S.J., M.S., Ph.D., has been appointed Dean of the Graduate School of the St. Louis University School of Medicine, St. Louis, succeeding Alphonse M. Schwitalla, S.J., Ph.D., who was appointed Dean to succeed the late Dr. Hanau W. Loeb. Dr. Don R. Joseph has been appointed Associate Dean.

Dr. Luther D. Greene, Richmond, has been appointed a member of the Board of Regents of the Northwest Missouri State Teachers College.

Blanche Kacena has been appointed Superintendent of the Out-Patient Department of the Jewish Hospital, St. Louis.

Dr. Eugene F. Hauck, St. Louis, Medical Director of the St. Louis Mutual Life Insurance Company for forty-three years, has resigned. He has been succeeded by Dr. Cleveland H. Shutt, St. Louis.

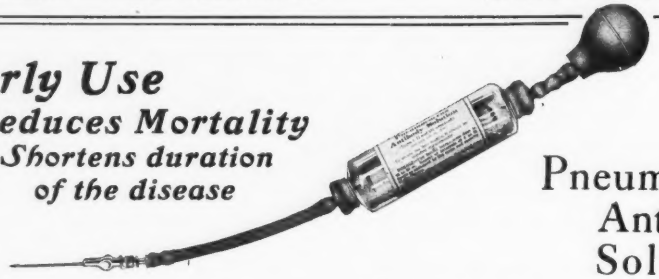
Dr. Wilfred E. Chambers, formerly in charge of the Veterans' Hospital, Excelsior Springs, is now Superintendent of the U. S. Veterans' Hospital, Kansas City.

Dr. Lee E. Monroe has resigned as Manager of the Bonne Terre Hospital, Bonne Terre.

Dr. Malvern B. Clopton was recently elected a member of the Board of Directors of the University Corporation of Washington University, St. Louis.

(Continued on page 44)

Early Use
Reduces Mortality
Shortens duration of the disease



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Specific

It is a clear, colorless, aqueous, specific treatment for the lobar pneumonias caused by Types I, II or III pneumococcus.

Early Use Essential

When used early (on or about the third day) a definite shortening in the duration of the disease is reported. *Beneficial results are in proportion to the stage of the disease at which the solution is administered.*

Extensive Clinical Tests

It has been subjected to a thorough clinical trial, over a period of six years, in thousands of cases.

No Serum Sickness

Serum sickness and anaphylaxis have not been observed in any instance.

Reactions

Thermal reactions, while they sometimes occur, are not dangerous and are easily controlled.

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Its use is a guarantee against milk-borne infections. The finer fat globule and friable curd---which are produced mechanically---promote digestion and assimilation.

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Based on the original formula. Recognized as the protein milk of choice by the hundreds of pediatrists who have used it continuously for five years. Prepared in home and hospital with equal facility.

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POWDERED WHOLE MILK

as cow's whole milk in your formulae!

--assures accuracy

--is easy to prepare

--always uniform and pure.

Merrell-Soule
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Correct in composition and acidity, possesses all the qualities of a hospital formula. Easy to prepare in the home. The desired friable curd is an inherent characteristic. A demonstrated clinical success.

Literature and samples sent promptly upon request.

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A Superior Maltose and Dextrin Product for Infant Feeding

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3. Contains 63% Maltose and 19% Dextrin.
4. Contains cereal protein, an effective colloid for casein modification.
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Directions and circulars are supplied to physicians only

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HORLICK— RACINE, WIS.

(Continued from page 42)

Deaths

Dr. Matthew M. Pollard, Barnard, aged 58, died November 16 of cerebral hemorrhage.

Dr. Marcus Boynton Austin, Brunswick, aged 57, died October 29 at the Robinson Sanitarium, Kansas City, of brain tumor.

Dr. William Perry Searcy, Exeter, aged 59, died November 14 of cerebral hemorrhage.

Dr. Ashman Henry Vandivert, Bethany, aged 74, died October 19 at Seattle, Wash., of cerebral hemorrhage.

Dr. John Henderson Tharp, Eversonville, aged 82, died November 12.

Dr. John Diederich Seba, Bland, aged 71, died November 1.

Dr. Bonifant Ramsey Harmon, Springfield, aged 60, died November 5 at Carthage.

Dr. Harry E. Epperson, Browning, aged 76, died October 20 of carcinoma of the prostate.

Dr. Robert Theodore Henderson, Jackson, aged 87, died October 15 of senility.

Dr. Thomas J. Ashley, Orrick, aged 61, died recently of heart disease.

Dr. William B. Scott, Bucklin, aged 62, died November 3.

Dr. O. W. Nauman, Craig, aged 50, died December 12 of angina pectoris.

Dr. William Wesley Hull, Fulton, aged 68, died November 14 of pneumonia.

Dr. Sebastian Cabot Hatten, Kansas City, aged 58, died October 10.

Dr. Thomas Wilson Overall, Kansas City, aged 68, died in October of carcinoma of the prostate and lobar pneumonia.

NORTH CAROLINA

Buncombe County Medical Society has elected Dr. O. F. Eckel, Asheville, President, and Dr. M. S. Broun, Asheville, Secretary. Dr. Paul H. Ringer, Asheville, has been appointed General Chairman of the local

(Continued on page 46)

RADIUM SERVICE

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Separate enlargements of this engraving and "Habit Time" mailed free on request.

SPASTIC CONSTIPATION

Fantus and other authorities say cathartics are usually contraindicated.

Spasticity may be the result of inflammatory conditions.

It may occur from vagatonic disturbances or accompany other bowel manifestations.

Petrolagar, in any colonic treatment, is superior to cathartics or older methods, because

—it aids in allaying spasm,

—it lessens the inflammation,

—it soothes the irritated mucosa and reduces hypersensibility.

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Gentlemen:—Send me copy of the new brochure "Habit Time" and specimens of Petrolagar.

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REG. U.S. PAT. OFF.

For accurate digitalis dosage by mouth

DIGITAN TABLETS

CONVENIENT

DEPENDABLE

STANDARDIZED

Sample sent upon request

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Main Office: Rahway, N. J.

(Continued from page 44)

Committee for the Southern Medical Association meeting in November.

Gaston County Medical Society has elected Dr. J. Sidney Hood, President; Dr. W. W. McChesney and Dr. T. C. Quickel, Vice-Presidents; Dr. J. A. Anderson, re-elected Secretary.

Iredell-Alexander Medical Society has elected Dr. S. A. Rhyne, President; Dr. E. E. Little, Vice-President; Dr. Roy C. Tatum, Secretary.

Mecklenburg County Medical Society has elected Dr. S. M. Henderson, President; Dr. Alonzo Myers, Vice-President; Dr. L. C. Todd, Secretary, all of Charlotte.

Guilford County Medical Society has elected Dr. D. W. Holt, Greensboro, President; Dr. Rigdon Dees and Dr. Russell O. Lyday, both of Greensboro, Vice-President and Secretary-Treasurer, respectively.

Dr. B. J. Witherspoon, Charlotte, and Dr. W. C. Powell, Petersburg, Virginia, were elected President and Vice-President, respectively, of the Seaboard Air Line Railway Surgeons' Association at a recent meeting at Miami, Florida.

Ten thousand dollars has been pledged toward the necessary improvement of St. Leo's Hospital, the largest and oldest hospital in Greensboro.

Dr. John T. Sprague has opened Dunworth Sanatorium, near Warrenton, for the care of nervous and convalescing patients.

Dr. A. H. Rose, Smithfield, has been elected a member of the Board of Education of the City of Smithfield.

Dr. W. J. B. Orr, Smithfield, has been elected President of the Kiwanis Club.

Dr. William Banks Anderson, Durham, and Miss Mildred Everett, Baltimore, Maryland, were married at New York, October 18.

Dr. Raymond Robinson Simmons, Winston-Salem, and Miss Reine Louise Musgrave, Norfolk, Virginia, were married October 25.

Dr. E. G. Moore, Elm City, and Miss Ursula Daniel, Halifax, were married at Richmond, Virginia, November 10.

(Continued on page 48)

THE words "Dryco" and "Infant Feeding" are synonymous in the minds of thousands of physicians who know from experience that this milk can always be relied upon for good results. The fact that all Dryco is activated antirachitically by the ultra violet ray is only one of the many reasons why it is considered the ideal milk.

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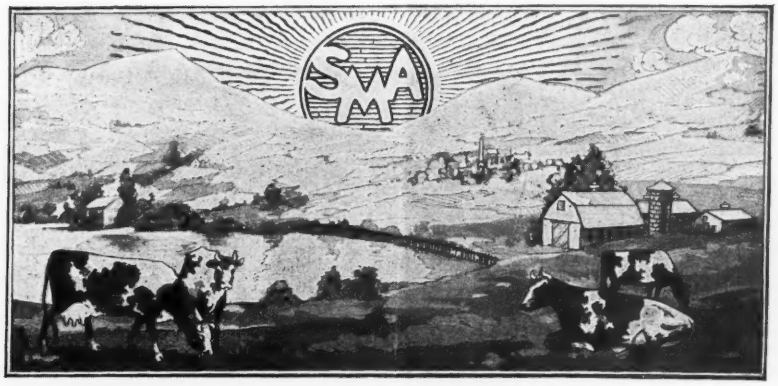
For Infants deprived of Breast Milk



A Sterilized measuring cup is in each can

To each measure of *S. M. A.* Powder

ADD

An ounce of boiled water.

1. Resembles Breast Milk both physically and chemically.

2. An excellent means of preventing Rickets and Spasmophilia.

3. It is simple for the mother to prepare—just add boiled water.

4. Only milk from tuberculin tested cows and from dairy farms that have fulfilled the sanitary requirements of the Cleveland City Board of Health, is used as a basis for the production of *S. M. A.*

5. Results, more simply and more quickly—explain the ever increasing use of *S. M. A.* by physicians.

May we send you literature and samples so that you may observe results in your practice?

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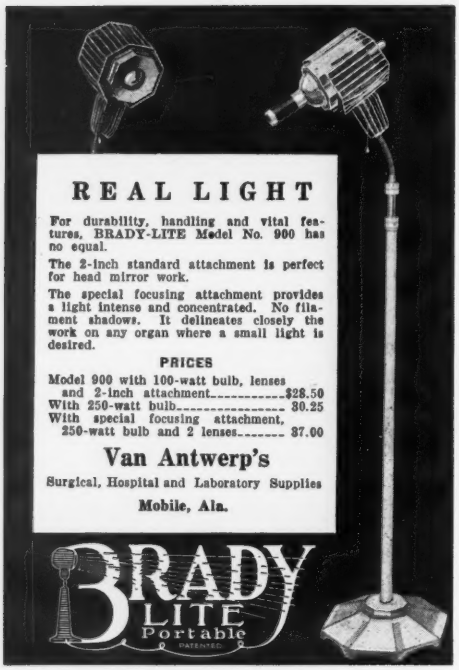
THE LABORATORY PRODUCTS COMPANY

CLEVELAND, OHIO

Fine Products for the Infant's Diet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For durability, handling and vital features, BRADY-LITE Model No. 900 has no equal.
The 2-inch standard attachment is perfect for head mirror work.
The special focusing attachment provides a light intense and concentrated. No filament shadows. It delineates closely the work on any organ where a small light is desired.
PRICES
Model 900 with 100-watt bulb, lenses and 2-inch attachment $28.50
With 250-watt bulb 30.25
With special focusing attachment, 250-watt bulb and 2 lenses 37.00
Van Antwerp's
Surgical, Hospital and Laboratory Supplies
Mobile, Ala.
BRADY LITE Portable
PATENTED

(Continued from page 46)

Dr. E. L. Stamey, Greensboro, and Miss Ida Graham, Concord, were married December 6.

Deaths

Dr. W. P. Whittington, Asheville, aged 73, died in January.

Dr. J. H. Harrison, Littleton, aged 69, died in January.

Dr. O. L. Denning, Dunn, aged 70, died suddenly at his home on December 3.

Dr. William A. Johnson, Wake Forest, died at the Rutherford Hospital November 25 as a result of injuries received in an automobile accident.

Dr. Robert Stuart Primrose, New Bern, aged 61, died December 3 of diabetes mellitus.

Dr. Jefferson Davis Jenkins, Tarboro, aged 64, died October 14 of cerebral hemorrhage.

OKLAHOMA

Muskogee County Medical Society has elected Dr. I. B. Oldham, Sr., President; Dr. R. N. Holcombe, Vice-President; Dr. A. L. Stocks, Secretary-Treasurer.

Dr. W. G. Husband, Hollis, has started work on a new hospital which will contain twenty-four private rooms.

Guthrie's Methodist Hospital Board plan a campaign to raise $60,000 to complete the hospital in Guthrie. Among those elected to the staff are: Dr. John E. Heatley, Dr. W. K. West and Dr. W. J. Wallace, Oklahoma City.

St. Anthony's Hospital, Oklahoma City, has been formally opened. It consists of five stories, costing $150,000, provides sixty rooms for patients, diet kitchens, utility rooms, interns' rooms, physicians' assembly and clinic rooms.

Morningside Hospital, Tulsa, has been opened.

Dr. Fowler Border, Mayor of Mangum, offers a first prize of $100 for the best rose garden. Mr. C. M. Stone offers the second prize of $50.

Dr. Loyal B. Torrance succeeds Dr. Franklyn A. Howell as City Physician of Okmulgee.

(Continued on page 50)

in amebic dysentery

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During the year just past, our BACILLUS ACIDOPHILUS CULTURE (B. A. CULTURE) made many new friends.

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We will gladly submit samples and descriptive literature if you will accord us that privilege.

B. B. CULTURE LABORATORY, INC.
Yonkers, New York

(Continued from page 48)

Colonel T. Hugh Scott, for several years superintendent of the U. S. Veterans' Hospital, No. 90, Muskogee, has been named Superintendent of the Edward Hines, Jr., Memorial Hospital, Maywood, Illinois. He succeeds Colonel R. W. C. Francis.

Dr. J. G. Smith, Bartlesville, and Miss Helen Wark were married in Dallas, Texas, November 24.

Dr. Clarenee C. Hoke, Tulsa, and Miss Jane Mitts were married at South Bend, Indiana, October 24.

Deaths

Dr. Charles Milton Morgan, Chandler, aged 55, died at Tucson, Arizona, November 6 after a long illness.

Dr. Carl Rudolf Williams, Bristow, aged 43, died November 11 of cerebral hemorrhage.

Dr. J. C. McGinnis, Anglers, aged 56, died October 30 of heart disease.

SOUTH CAROLINA

Chesterfield County Medical Association has elected Dr. J. S. Gaskins, Mt. Croghan, President; Dr. R. L. Gardner, Chesterfield, Vice-President; Dr. R. J. Coney, Cheraw, Secretary-Treasurer.

The Medical Society of South Carolina, Charleston, has elected Dr. H. P. Jackson, President; Dr. E. L. Jagar, Vice-President; Dr. W. Atmar Smith, Secretary; Dr. Jos. H. Cannon, Treasurer.

The Pee Dee Medical Association met in Florence November 22. Dr. E. M. Dibble, Marion, was elected President and Dr. S. C. Henslee, Secretary.

Dr. John S. Gaskin, Mount Croghan, and Dr. Madge Baker, Ridgeland, were married October 5.

Deaths

Dr. Thomas Grange Simons, Charleston, aged 85, died at the Riverside Infirmary recently.

Dr. Clarence Prescott DeVore, Edgefield, aged 76, died November 21 of uremia.

Dr. Edwin Paris Derrick, Columbia, aged 53, died November 13.

(Continued on page 52)

In Gastric Ulcer

Hare and others have drawn attention to the persistent presence of an excess of hydrochloric acid both as to percentage strength and quantity.

Kalak Water helps to combat such hyperacidity. It is unusually well borne and preferable to single alkalies because less apt to set up an alkalosis.

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Irritation in the broncho-pulmonary tract is alleviated by the small dose of LUMINAL without the undesirable effects of the opiates. The cresolsulphonates liquefy tenacious secretions and facilitate expectoration.

DOSE: For adults, 2 or 3 teaspoonfuls in water three or four times daily. For children, ½ to 1 teaspoonful.

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(Continued from page 50)

TENNESSEE

The forty-fourth annual meeting of the Tri-States Medical Association of Mississippi, Arkansas, Tennessee, will be held in Memphis February 29-March 1-2.

The Day Investment Company has purchased the Medical Arts Building, Memphis. Mr. Oran L. Sackett, who is said to have promoted the building, is to be Manager under the new ownership.

Dr. Nat H. Copenhaver, Bristol, has been elected President of the Roanoke College Alumni Association.

Dr. John W. Dennis has resigned as Director of the Washington County Department of Health. He is succeeded by Dr. Samuel S. Moody.

Dr. Minyard D. Ingram, Eaton, has recently accepted a full-time position with the State Department of Health.

Dr. Charles B. Crittenden, formerly Health Commissioner of Tennessee, has gone to New York to enter practice.

The home of Dr. William Hall, near, Falls, was recently destroyed by fire.

Dr. Joseph A. Crisler, Jr., Memphis, and Miss Elizabeth Crile, Cleveland, were married November 23.

Dr. Cleo Chastain and Mr. R. L. Parcell were married in Chattanooga November 23.

Deaths

Dr. Paul Neal, West Point, aged 66, died November 18.

Dr. H. A. Rogers, Knoxville, aged 72, died November 2.

Dr. H. E. Goetz, Knoxville, aged 53, died in Philadelphia following an operation for tumor of the brain.

Dr. Lawrence H. Pendergrast, Memphis, aged 47, died November 25 of cerebral hemorrhage.

Dr. Turner Lawrence Johnson, Green Brier, aged 83, died November 12 of heart disease.

Dr. James Anthony Sisk, Knoxville, aged 75, died November 16 at the Howard-Henderson Hospital of pneumonia following a fracture of the hip received in a fall.

TEXAS

The South Texas District Medical Association met at Houston October 13-14.

The twenty-third semi-annual meeting of the Texas Surgical Society was held in Galveston November 7-8. Dr. F. L. Barnes, Houston, was elected President; Dr. C. C. Cade, San Antonio, and Dr. Willard R. Cooke, Galveston, Vice-Presidents; Dr. H. L. D. Kirkham, Houston, Secretary; Dr. J. B. Smott, Dallas, Treasurer

Hill County Auxiliary was organized October 5 and the following officers elected: Mrs. Ben C. Smith, Hillsboro, President; Mrs. J. S. McKown, Oceola, Mrs. H. A. Mahaffey, Hillsboro, Mrs. C. C. Campbell, Itasca, and Mrs. W. I. Ariedge, Hillsboro, Vice-Presidents; Mrs. Charles Garrett, Hillsboro, Recording Secretary; Mrs. J. F. McDonald, Hillsboro, Corresponding Secretary; Mrs. T. R. Barnett, Hillsboro, Publicity Secretary; Mrs. J. W. Miller, Hillsboro, Parliamentarian; Mrs. J. E. Boyd, Hillsboro, Treasurer.

The Texas and Pacific Railway Hospital Association has authorized the construction of a two-story fireproof hospital at Marshall. The new building will have a capacity of 105 beds and will cost approximately $200,000.

A bond issue of $500,000 was recently floated for the erection of one unit of the $1,500,000 Methodist Hospital to be built in Fort Worth. When completed it will consist of three units, the other two to be erected as the need arises.

St. Anthony's Sanitarium, Amarillo, will have a $500,000 addition, which will double the present capacity. The old quarters will be completely remodeled.

Dr. S. P. Rice, Marlin, has accepted a position on the staff of the Buie Clinic, Marlin, as Gynecologist and Consultant. Dr. J. I. Collier, formerly of Taylor, has been added to the staff, and will have charge of the eye, ear, nose and throat service.

Deaths

Dr. Thomas Lillie Pierce, Carbon, aged 71, died October 23 of hypostatic pneumonia.

(Continued on page 54)

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The Leading OTOSCOPE

This Otoscope has the largest lens disc and best lamps used in instruments of its type, and provides magnification and easy observation for diagnosis, operative work or testing the mobility of the ear drum.

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HOTEL PEABODY

MEMPHIS, TENNESSEE

February 29-March 1-2, 1928

Read this list of those who will deliver addresses and make your hotel reservation at once, or better, ask the Secretary to do it for you.

Dr. John M. T. Finney, Prof. Clin. Surg., Johns Hopkins Univ., Baltimore, Md.
Dr. Joseph Brenneman, Pediatrics, Chicago, Ill.
Dr. Gerald B. Webb, Tuberculosis, Colorado Springs, Colo.
Dr. Eugene L. Fisk, Med. Dir. Life Extension Institute, New York, N. Y.
Dr. Chas. L. Mix, Prof. Med. Loyola Univ., Chicago, Ill.
Dr. James H. Hutton, Endocrinology, Chicago, Ill.
Dr. H. Winnett Orr, Orthopedics, Lincoln, Neb.
Dr. Henry G. Bugbee, Urology, New York, N. Y.
Dr. Robert C. Lynch, Prof. Oto-Laryng. Tulane Univ., New Orleans, La.
Mr. Geo. E. Vincent, Pres. Rockefeller Found., New York, N. Y.
Dr. John Phillips, Div. Med., Cleveland Clinic, Cleveland, Ohio.
Dr. Henry Schmitz, Gynecology, Chicago, Ill.
Dr. Paul Titus, Obstetrics, Pittsburgh, Pa.
Dr. Howard Fox, Prof. Derm., New York Univ., New York, N. Y.
Dr. George Morris Piersol, Prof. Med., Univ. Penn., Philadelphia, Pa.
Dr. Walter E. Dandy, Assoc. Prof. Clin. Surg., Johns Hopkins Univ., Baltimore, Md.
Dr. F. M. Pottenger, Int. Med., Monrovia, Calif.
Dr. Irvin Abell, Clin. Prof. Surg., Univ. of Louisville, Louisville, Ky.
Dr. David S. Lewis, Ass't. Prof. Therap., McGill University, Montreal, Canada.

DR. A. F. COOPER, Secretary-Treasurer,
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(Continued from page 52)

Dr. John C. McGaughy, Palestine, aged 56, died August 1 of heart disease.

Dr. Matthew Simpson Metz, McKinney, aged 66, died suddenly October 27.

Dr. Theodore C. Brassell, San Antonio, aged 69, died October 14 of pyonephrosis and suppurative arthritis.

Dr. Penn B. Thornton, Houston, aged 60, died August 15 of heart disease.

Dr. Franklin Jennings Gilson, Calvert, aged 74, died May 24 of senile gangrene.

Dr. Nicholas C. Parrish, Pottsboro, aged 71, died October 29 of heart disease.

Dr. Oscar L. Thweatt, Post, aged 66; died October 28 at the Lubbock Sanitarium, Lubbock, of cerebral hemorrhage.

Dr. Thomas N. H. Wylie, Pilot Point, aged 83, died October 23.

Dr. Charles Emmett Durham, Austin, aged 58, died November 30 of heart disease.

Dr. David C. Wylie, Peacock, aged 55, died July 21 of myelogenous leukemia.

Dr. William James Price, Gainesville, aged 66, died October 2 of heart disease.

Dr. DeWitt Clinton Combest, Denison, aged 63, died November 5 of heart disease.

Dr. Albert Beckmann, Ycakum, aged 65, died August 31.

VIRGINIA

Augusta County Medical Society has elected Dr. J. Fairfax Fulton, President; Dr. W. F. Hartman, Stanton, Secretary; Dr. T. M. Parkins, Staunton, Treasurer.

The Clinch Valley Medical Society held its semi-annual meeting at Norton. The following officers were reelected: Dr. C. B. Bowyer, Stonega, President; Dr. J. M. Daughtery, Nickelsville, Dr. P. D. Pence, St. Charles, and Dr. T. T. McNeer, Dante, Vice-Presidents; Dr. J. C. Sutherland, Clintwood, Secretary-Treasurer.

(Continued on page 56)

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THE hopelessness of a patient who, tied down by economic bonds, has been advised to travel . . . is only matched by the perplexity of his physician, who knows there is no substitute for plentiful mountain sunlight, fresh air and relaxation, with all its physical and mental implications.

Yet the medical profession long ago learned to continue the combat under the most adverse conditions. And, among the modalities which science has made available is ultraviolet light, administered by the quartz mercury vapor arc lamp. Reproducing the vital, invisible rays of the sun, unfiltered and unobstructed, in concentrated, therapeutic intensity . . . making available healing and energizing light at the bedside, in the office or hospital . . . the Alpine Sun Lamp is *an efficient weapon* in the hands of the physician.

Clinical findings point most definitely to the effectiveness of quartz light for improving general health, affording increased resistance to disease, enriching the blood stream and affording a powerful analgesic. The published reports of qualified investigators furnish convincing data upon the effectiveness of this therapeutic modality. A few significant papers will be furnished you upon request.

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(Continued from page 54)

Lee County Medical Society has reelected Dr. C. C. Pearce, Pennington Gap, President, and elected Dr. P. D. Pence, St. Charles, Secretary.

Piedmont Medical Society has elected Dr. H. T. Nelson, Charlottesville, President; Dr. W. C. Mason, Gordonsville, and Dr. H. L. McCoy, Crozet, Vice-Presidents; Dr. Lewis Holladay, Orange, Secretary-Treasurer.

The Seaboard Medical Association of Virginia and North Carolina met at Norfolk December 6-8. Dr. David T. Tayloe, Jr., Washington, North Carolina, was elected President; Dr. C. W. Eley, Portsmouth, Dr. S. P. Bass, Tarboro, North Carolina, Dr. C. C. Smith, Norfolk, and Dr. V. P. Perry, Kinston, North Carolina, Vice-Presidents; Dr. Clarence Porter Jones, Newport News, reelected Secretary; Dr. A. M. Burfoot, Fentress, reelected Treasurer.

The Virginia Hospital Association met in Petersburg October 19. Dr. J. M. Shackelford, Martinsville, was elected President; Dr. Hugh H. Trout, Roanoke, and Dr. J. E. Rawls, Suffolk, Vice-President; Dr. John O. Boyd, Roanoke, Secretary-Treasurer.

The Virginia Pediatric Society held its second annual meeting at Petersburg October 19. Dr. Lawrence T. Royster, University, was elected President; Dr. Chas. E. Conrad, Harrisonburg, Vice-President; Dr. Wm. B. McIlwaine, Petersburg, Secretary-Treasurer.

The Association of Surgeons of the Chesapeake & Ohio Railway has elected Dr. William T. Graham, Richmond, President.

At the last meeting of the Medical Society of Virginia it voted to appropriate not more than $150 for the purpose of a suitable marker to identify the home of Dr. Ephraim McDowell, the pioneer in abdominal surgery, in Rockbridge County.

The Virginia Education Association at its meeting in Richmond in November voted to name the State Preventorium now being erected at the University of Virginia, The Ennion G. Williams Preventorium, in

(Continued on page 58)

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Five Piece Matched Suite
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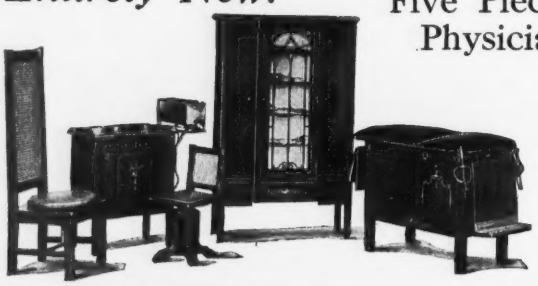

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Liver Diet IN Pernicious Anemia

Drs. Murphy and Minot, Whipple, Koessler and Maurer and others all agree–

That a diet rich in vitamine-B is essential in these cases. In fact, the value of the liver itself may be partly or wholly attributable to its vitamine content.

Dr. H. M. Connor, Rochester, Minn., says (A. M. A., Sept. 3, 1927):

Vitamine deficiency suggests itself by the resemblance of pernicious anemia to sprue and pellagra. He also suggests the Yeast Extract in place of more bulky yeast. "The high vitamine diet has an advantage over liver because of its palatability and the lessened possibility of disturbing the general metabolism."

Murphy and Minot recognize "the similarity of certain symptoms and signs . . . of pernicious anemia to those of pellagra, sprue and beri beri, diseases due to, or associated with, a faulty diet." (Pellagra, sprue and beri beri have all been cured by Brewers' Yeast-Harris and Vitamine-B Concentrate.)

Drs. Koessler and Maurer, Chicago, Ill., say (A. M. A., Sept. 3, 1927):

Medication—

One-half hour before each meal, 1 tablespoonful of wheat embryo extract in orange juice.

Immediately before each meal (three times daily) 50 drops of dilute hydrochloric acid in orange juice or water.

During the meal, 50 drops of dilute hydrochloric acid in water.

After the meal, 50 drops of dilute hydrochloric acid in water.

Three times daily, from one to two teaspoonfuls of powdered brewers' yeast (Harris') or three times daily two tablets of Harris' Yeast Tablets (standardized for vitamine-B content).

BREWERS' YEAST-HARRIS (Medicinal)

and

CONCENTRATED VITAMINE-B TABLETS

Are Indicated Especially in

PELLAGRA—ANEMIAS—ANOREXIA

and various types of Herpes and as a "stimulant to cell metabolism" in a variety of gastro-intestinal disorders.

Specifically indicated in dietary deficiency diseases wherever a highly concentrated preparation of Vitamine-B is required.

The American Red Cross and U. S. Public Health Service have specified BREWERS' YEAST, not the "bread-raising variety," as a cure for pellagra.

Connecticut Experiment Station, Bul. 240, has shown the *superiority of brewers' yeast over bakers' yeast* as a source of vitamine-B.

Sample bottle of yeast or Yeast Vitamine Tablets. To physicians only, $1.00 each.

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NEW ORLEANS, LA.

(Continued from page 56)

honor of Virginia's State Health Commissioner since 1908. The building is being erected by voluntary subscriptions from the teachers as part of the University's medical extension program. It will provide accommodations for teachers who by treatment might be saved from serious illnesses.

The Southside Community Hospital, Farmville, of fifty beds, was opened November 9. The Hospital cost $250,000 and was made possible by the large gift from the Commonwealth Fund of New York.

Improvements to the Winchester Memorial Hospital, Winchester, cost approximately $200,000. The new three-story addition has increased the capacity from seventy to one hundred and thirty patients.

The Accomac and Northampton Memorial Hospital, Massawadox, on the Eastern Shore, with a capacity of seventy-five beds, has been completed.

Dr. E. H. Alderman, a member of the Medical Staff of the Eastern State Hospital, Williamsburg, has become a member of the Medical Staff of Westbrook Sanatorium, Richmond.

Dr. Douglas VanderHoof, Professor of Clinical Medicine at the Medical College of Virginia, has presented the library of the College with a valuable collection of medical journals, scientific papers and bound volumes.

St. Philip Hospital, Richmond, operated by the Medical College of Virginia for colored people and for teaching purposes, has received $130,000 for the care and treatment of patients from the Martha Allen Wise estate.

Dr. Ben H. Gray, Richmond, has been elected a member of the Board of Directors of the Country Club of Virginia.

(Continued on page 60)

CLASSIFIED ADVERTISEMENTS

WANTED—Chief, Bureau of Vital Statistics, State Health Department; $3600-$4000 a year. Applicants must have a degree in medicine, and be familiar with statistical methods. Closing date, February 20, 1928. Apply State Employment Commission, 22 Light Street, Baltimore, Maryland.

WANTED position as technician in microscopical and chemical laboratory or in physician's office. Can do stenographic work, type and light bookkeeping. Address Box 606, Hattiesburg, Mississippi.

WANTED POSITION by thoroughly reliable physician, experienced in internal medicine and diseases of chest, as traveling representative for ethical house, or insurance company, Southern or Western States preferred. Address care R. J. F., Southern Medical Journal.

WANTED—An experienced psychiatrist as assistant in Glenwood Park Sanitarium, Greensboro, N. C. Address W. C. Ashworth, M.D., Owner, Greensboro, N. C.

BUSY PHYSICIANS—Any medical or surgical subject prepared to your specifications, from the latest sources and data available. We welcome abstruse topics for investigation and development in good form, and have excellent facilities for prompt service, at reasonable rates. Please address, AUTHORS RESEARCH BUREAU, 500 Fifth Avenue, New York.

DRUG AND ALCOHOLIC PATIENTS are humanely and successfully treated in Glenwood Park Sanitarium, Greensboro, N. C.; reprints of articles mailed upon request. Address W. C. Ashworth, M.D., Owner, Greensboro, N. C.

TO THE MEDICAL PROFESSION: We are filling a long felt want by conducting a training class teaching blood counts, urinalyses, sputum and feces examinations, also basal metabolism readings. We will gladly furnish you with competent office assistants trained in such laboratory procedures as you may require. Our classes are made up of stenographers, bookkeepers, registered nurses and clerks. Send us your office assistant for training. Write or telephone for full information. Dial 3-3598. John V. Mix, Director, Alabama Pathological Laboratory, 1005 Martin Building, Birmingham, Ala.

a COLON food

IT IS generally conceded that changing the intestinal flora is desirable. The older methods of accomplishing this, however, were variable.

The new method, now practiced as a routine in the Battle Creek Sanitarium, is the use of the colon food, Lacto-Dextrin.

This food product with a therapeutic purpose promotes the growth of the benign bacteria in the intestine. It is pleasant to take and definite in action.

This most interesting development is fully described in a scientific presentation on *"The Intestinal Flora."* Copy mailed free to every physician. Write for it today.

Lacto-Dextrin is now available at all good prescription pharmacies.

Bulk as an Aid

It is often desirable to promote peristalsis as an aid in securing a change of the Flora. For this purpose Psylla gives bland, non-irritating bulk and lubrication in the intestine. We will send you a sample of this new and effective agent. The name

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BRADY'S POTTER BUCKY DIAPHRAGM insures finest radiographs on heavy parts, such as kidney, spine, gall-bladder or heads.

Curved Top Style—up to 17x17 size cassettes.....$250.00
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CHICAGO

(Continued from page 58)

Dr. F. A. Sinclair, Newport News, has been elected President of the Tidewater Fox Hunters' Association.

Dr. Nat H. Copenhaver, Bristol, Virginia-Tennessee, Vice-President of the Roanoke College Alumni Association, succeeds the late Dr. Sparrell Gale as active head of the Association until its annual meeting.

Dr. Isaac Harry Goldman and Miss Katherine Sabina Trauerman, both of Richmond, were married November 28.

Dr. Carleton Moorman, Altavista, and Miss Mary Katharine Smith, Martinsville, were married November 16.

Dr. M. E. Hundley, Martinsville, and Miss Mary Kate Black, Spartanburg, South Carolina, were married November 16.

Dr. Robert Felix Gillespie, Bastian, and Miss Mary Virginia Jessel, Lebanon, were married November 16.

Dr Guy Carleton Amory, Hilton Village, and Miss Bessie Lee Granger, Richmond, were married November 26.

Deaths

Dr. Robert Glasgow, Lexington, aged 71, died November 19 after a long illness.

Dr. John William Waldron, Grundy, aged 75, died October 23 of cerebral hemorrhage.

Dr. Richard B. Fishburn, Leesburg, aged 76, died September 14 at Staunton of arteriosclerosis and mitral stenosis.

WEST VIRGINIA

The Academy of Medicine of Parkersburg has elected Dr. R. H. Paden, Parkersburg, President; Dr. H. M. Campbell, Parkersburg, Vice-President; Dr. J. T. Goff, Parkersburg, Secretary-Treasurer.

Barbour-Randolph-Tucker County Medical Society has elected Dr. W. E. Whiteside, Parsons, President; Dr. C. B. Williams, Philippi, and Dr. C. H. Hall, Elkins, Vice-Presidents; Dr. J. C. Irons, Horton, re-elected Secretary-Treasurer.

Fayette County Medical Society has elected Dr. H. A. Walkup, Mt. Hope, President; Dr. Ralph Hogs-

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(Continued from page 60)

head, Carbondale, Dr. E. E. Jones, Mt. Hope, and Dr. G. G. Hodges, Kilsythe, Vice-Presidents; Dr. G. A. Smith, Montgomery, Secretary-Treasurer.

Greenbrier Valley Medical Society has elected Dr. C. F. Mahood, Alderson, President; Dr. H. L. Beard, Lewisburg, Vice-President; Dr. J. G. Leach, Quinwood, Secretary-Treasurer.

Harrison County Medical Society has elected Dr. Americus J. Kemper, Lost Creek, President; Dr. Eugene B. Wright, Clarksburg, Vice-President; Dr. B. S. Brake, Clarksburg, Secretary; Dr. Earl Allen Teets, Clarksburg, Treasurer.

Kanawha Medical Society has elected Dr. W. W. Point, Charleston, President; Dr. J. R. Shultz, Charleston, Secretary-Treasurer.

Marshall County Medical Society has elected Dr. C. G. Morgan, Moundsville, President; Dr. J. E. Cooper, Cameron, Vice-President; Dr. J. H. Luikart, Moundsville, Secretary; Dr. O. P. Wilson, Moundsville, Treasurer.

The Hospital Association of West Virginia held its second annual meeting in Charleston December 5. Dr. L. W. Lawson, Logan, was elected President; Dr. J. E. Wilson, Clarksburg, and Dr. R. A. Ireland, Charleston, Vice-Presidents; Mr. J. S. Turk, Wheeling, Treasurer; Mr. Joe W. Savage, Charleston, was retained as Executive Secretary.

Dr. J. A. Arbuckle, Charleston, who has been associated with Dr. V. T. Churchman in his private hospital since 1919, has moved to Richmond, Kentucky, where he will have charge of the Eye, Ear, Nose and Throat Section in the Pattie A. Clay Memorial Hospital and will be associated with Dr. M. M. Robinson, Chief Surgeon of the institution.

Dr. C. L. Woodbridge has recently joined the staff at the Coal Valley Hospital and Clinic, Montgomery.

M. M. Russell is the new Superintendent of the Camden-Clark Hospital, Parkersburg. He succeeds Bessie B. Pickering, resigned.

Deaths

Dr. Martin L. Miller, Mannington, aged 81, died October 18 of decompensation of the heart.

Dr. Norman D. Jobes, Elm Grove, aged 64, died October 16 of pneumonia.

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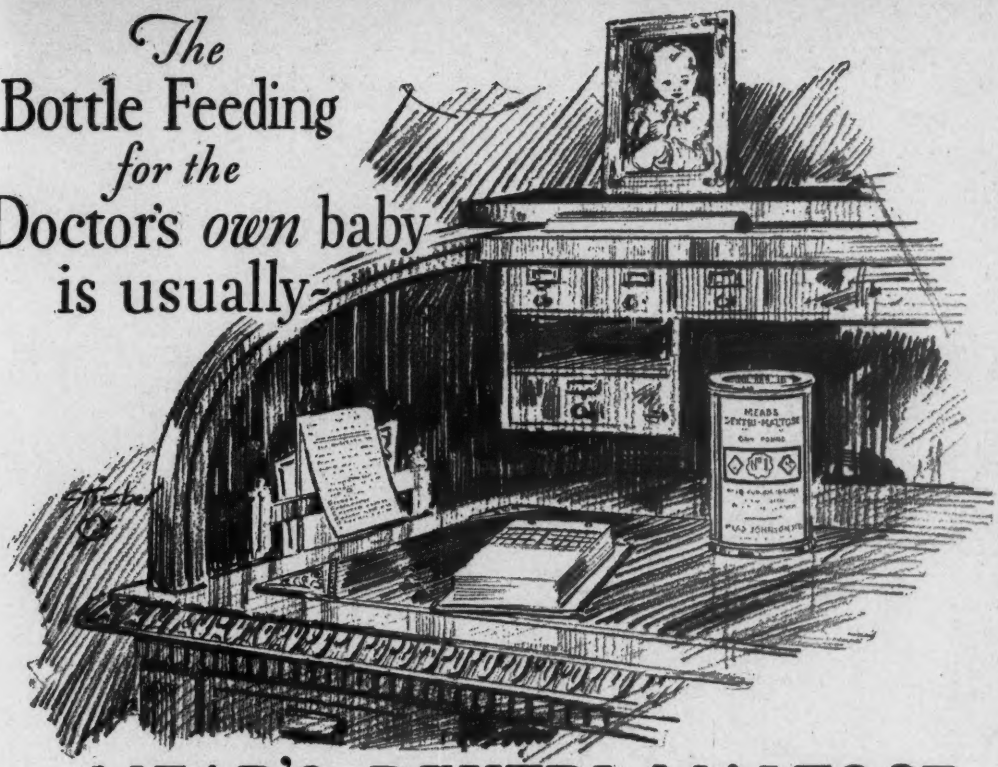

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